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New England Association of Gas Engineers.

NARRATIVE OF INCIDENTS OF THE EXCURSION OF THE NEW ENGLAND ASSOCIATION OF GAS ENGINEERS, ON THE DAY FOLLOWING THEIR SEMI-ANNUAL MEETING AT PROVIDENCE, AUGUST, 1875.

THE START.

Very punctually, within half an hour of the time appointed for starting, the party assembled on Thursday morning, Aug. 19, in front of the Aldrich House, where they found a large covered wagon, such as is generally employed in transporting people and other freight from place to place, with several horses, and a driver and assistant, waiting for them.

Some little delay in getting under weigh was experienced, on account of the non-appearance of the member from Portland, but in a short time he showed himself, and the party proceeded on their way. At the first opportunity the delinquent member apologized for his tardiness, and stated that he had overslept himself, in consequence of having been kept up the previous evening till after 10 o'clock by a little matter of business, which it was necessary to transact; and further, that he had lost considerable time in the morning, looking for his hat, which he had accidentally left the night before in one of the numerous rooms of the hotel, without entering in his diary the number and location of that room.

The carriage employed on the occasion, which was estimated at about forty-two feet capacity, was completely filled with *gas* men, most of them men of large understanding, and of great specific gravity; so the wheels kept well to the ground, but the horses had all they could do to drag along their precious burden. The member, formerly of the New Haven Gas Co. insisted upon sitting at the rear of the carriage, doubtless expecting that tickets or change would be required of the passengers as they took their seats, and being very willing to act as conductor on the occasion. But he was disappointed at finding that, through the generosity of the Providence Gas-Light Co. the whole affair was to be free. Mr. Slater, the manager of that company wore a white hat, and acted as Chief Marshall, and under his able direction the whole excursion was managed in a very creditable manner.

PROVIDENCE GAS WORKS.

The party first visited the old works of the company, where as much time was spent in observation as the restless Chief Marshall would allow, he appearing all the while to be apprehensive that so much time would be consumed by riding and sight-seeing about the city, that by the time the expedition should arrive at Maxfields, the clams would be cold; for at every point where a stop was made, in a few minutes would be heard above the noise of machinery, the whistling of locomotives, and the singing of birds, his stentorian voice shouting that famous old battle cry, which has nerved the arm of the patriot soldier, and roused him to the highest pitch of enthusiasm, and inspired him to the performance of the noblest deeds of daring—"Time is up; all aboard."

PROVIDENCE WATER WORKS.

The next place visited was the high service pumping station of the Providence water works. Here the visitors alighted from their chariot, with more or less difficulty, being somewhat demoralized by the "dog day weather," and passed into the building occupied by a very unique Corliss steam pump, which at once by its singular appearance, attracted the earnest attention of the beholders.

The writer will endeavor to give a brief but very lucid description of this wonderful piece of machinery, as he viewed it from above, standing on a high circular balcony guarded by a polished brass rail. It has the exact appearance of an enormous wheel lying flat on its side, the periphery being hollow and filled with water. From the hub, which is surmounted by a crank, radiates horizontally, valve rods, piston rods, and other rods, terminating in steam cylinders, valve-boxes, and water plungers, which are arranged around the circumference of the wheel or engine alternately—now a pump and now an engine. There is no tire to this wheel, for in fact it is never tired, but keeps constantly at work untiringly. The design of this accurately described piece of mechanism is to furnish a never failing supply of water for the upper portions of the city, at a constant, unvarying pressure or head. It is self-acting, and consequently the services of an engineer are not required, except to prevent pilfering of the brass work on the engine or railing, or the possible carrying off of the whole machine itself by such suspicious characters as the present party was composed of. For further information with regard to the cost and construction of the above described engine, please apply to the member from Waltham.

PROSPECT PARK.

The carriage was again resorted to, and the party proceeded up a steep ascent, through several streets, passing near some very elegant residences, and again alighting they entered the enclosure of Prospect Park, which, by the way, is not fenced in. This place was named some time after the famous park in Brooklyn, N. Y., which by a remarkable coincidence, bears the very same name. Of the two we should judge the Brooklyn Park to be the larger one; yet we may be mistaken, as we have never measured either except with the eye.

From here a most charming scene meets the delighted gaze, comprehending a *three-sided panoramic* view of the city of Providence, and of the surrounding country. The most conspicuous object in the range of vision is the magnificent building containing the new gas holder of the Providence Gas Co. The upper part of the structure is a spacious dome surmounted by a cupola, the whole reminding those few who have been permitted to travel in foreign lands, of the glorious old cathedrals, whose foundations were laid long before petroleum was discovered.

While the visitors lingered, loath to leave the spot, the hoarse voice of the Marshall was heard uttering the battle cry, and the rush to the vehicle was tremendous. After a short ride, in a decidedly downward direction, the member from New Haven throwing all his weight upon the end for ballast, a safe landing was made at the establishment of the Corliss Engine Co., where the party were escorted through the works by the gentlemanly superintendent.

CORLISS ENGINE COMPANY'S WORKS.

The buildings are very extensive, covering over a large area, and are completely furnished with the best and most costly machinery required for use in such an establishment.

The time allowed by the restless Chief was barely sufficient for a rapid walk through the buildings and a hasty glance at their contents. Before leaving, three cheers in honor of the proprietors of the manufactory were called for, which were given with a hearty good will.

The last place visited before taking the boat was the

NEW GAS WORKS OF THE PROVIDENCE GAS CO.

Here the leader of the expedition, being much exhausted by his efforts to keep the party in motion, took off his white hat and sat down to breathe. This respite from constant motion was gladly availed of by the visitors, who strolled about through the works, examining the machinery, watching the operations of the men employed in hoisting coal, drawing and charging retorts, etc. The manager received many well deserved compliments upon the excellent condition of the works.

On leaving, the visitors were regaled with pure ice water, furnished gratuitously by the company, which act of kindness was highly appreciated by the thirsty crowd. The new gasholder mentioned heretofore, being at a short distance from the works was visited, and some of the most daring of the party who had not imbibed too freely of ice water, climbed the steep stairway as far as the base of the dome, but decided, not to ascend through the dome to the cupola; not through fear, but "because it was too warm." But now the Chief Marshall having fully recovered his voice and his strength, shouted louder than ever before, "Time is up—all aboard," and the party were soon

ON THEIR WAY TO THE BOAT,

pleased with the near prospect of a good dinner to be devoured at the expense of somebody else.

At the wharf all were delighted at meeting Mr Stiness of the Pawtucket Gas-Light Co., who had just recovered from a severe illness, the effect upon him being still painfully apparent. Here it may be well to state that the secretary, from the time of leaving the hotel until this moment, had suffered great distress of mind and uneasiness from the loss of his umbrella—a gingham one—which he had taken along with him in the carriage, although not a drop of rain fell at the time of starting. But he acted, as he thought, prudently, not forseeing the consequence, and in the spirit of the old adage, which read thus, "A wise coal gas engineer takes his umbrella with him when it don't rain, while a foolish visionary who dabbles in naphtha, leaves his at home whether it rains or shines." In spite of diligent and oft repeated search in the vehicle, by the loser, every time it was vacated, no trace of the missing article could be found, until, at the wharf, it was handed to him by one of the party (innocent looking enough outside, but very deceitful within), with the very comforting remark, "There's your umbrella." Upon reflection the writer is inclined to the belief that the missing umbrella, all the while, must have been concealed in a leg of the pantaloons of one of the party; but how that individual with his leg thus encumbered by a stiff back bone, as it were, could sit comfortably in a crowded vehicle, is now, and always will be, a great mystery to the writer.

The steamer to take the party down the river not arriving at the wharf on time, passage was taken in a steam tug lying near, which soon started. After a pleasant sail of about half an hour,

MAXFIELD'S SILVER SPRING

was reached without accident of any kind, no one being sea-sick, and no one falling overboard. On landing the party were met by their associate Col. Armington, who received the warm greetings of his friends with quiet dignity,

After a short interval, occupied in rambling about the grounds, or sitting in the spacious verandah, through which the fresh breezes from the salt water were circulating with a delightfully cooling effect, the company were summoned to dinner. The call was obeyed with remarkable alacrity, and soon all were hard at work, devouring with keen appetites the clams, "done to a turn," as they came fresh from "Hiram's" bakery. Relays of fritters and other good things were supplied as fast as required. Soon the busy guests disappeared, one after another, behind huge piles of shells, and by the time the feast was over and the declamation, according to custom, should begin, the president found it impossible to put his eye on a single person present, except the secretary, who don't eat clams, while suffering from an attack of the *umbrella complaint*. Nothing could be seen but shells here, shells there, shells everywhere, so speech-making was dispensed with and the company left the table with reluctance, some to recline in the verandeh to cool off and rest, some to stroll about or lie down on the green grass, while a large delegation under the lead of the gallant Colonel, visited the beautiful grounds and apartments of the "Squantum Club," of which he is a member.

While there, some of the party wishing to warm up or to settle their dinners, or lured by the rare opportunity then afforded them of bowling, without paying for the privilege, amused themselves with attempting to knock over the innocent pins, but with such indifferent success, that the secretary, who was looking on, retired in disgust.

During the visit many of the party were introduced to the veritable Hiram Maxfield, who is short in stature; but what he lacks in "length of keel" he makes up in "breadth of beam." Just before leaving the president called the members together for an informal meeting, when it was "voted, that the thanks of the New England Association of Gas Engineers be tendered to the officers of the Providence Gas-Light Co., and to the treasurer in particular, for the generous and hospitable manner in which they have entertained the members of the Association during their visit in Providence, on the occasion of their holding their semi-annual meeting of the Association." This was responded to by the treasurer, Mr. Slater, who took off his white beaver, wiped his damp forehead, and made a low bow, but said not a word.

As the steamer which was to convey the party

BACK TO THE CITY,

approached the landing, the Chief Marshall, now utterly demoralized by his arduous labors, both in the field and at the festal board, without his usual *clamor*, in a voice of sweetness and pathos, uttered these words, "The boat is coming, and if you don't hurry you will be left." Regarding the speaker for a moment in utter amazement, the party made a sudden rush for the wharf, and soon were on board the steamer and on their way to the city, which was reached in due time, no fogs or icebergs having been encountered. Safely landed, the party proceeded on foot to the Aldrich House, where a short time having been spent in settling up, bidding farewell to one another, and expressing their thanks most heartily to their efficient leader and host, A. B. Slater, Esq., they parted with mutual sentiments of respect and esteem, and soon were on their way to their respective homes, which it is hoped they all reached in safety.

Having concluded this imperfect narrative, the undersigned would express the hope, that if in any portion of it he may have seemed to have indulged in exaggeration, or an inclination to misrepresent and distort facts, it may not be attributed to an intentional design to pervert the truth, or to acquire ignoble fame as a writer of fiction.

He pleads as his excuse for any seeming inaccuracies or misrepresentations in the narrative, the injurious effects of the severe mental depression under which he suffered during the excursion, brought on and aggravated by the temporary loss on that occasion, of the valued and trusty companion of his rainy days.

THE SECRETARY.

Naphthalin and Petroleum as Enrichers.

The following is a translation of a paper which appeared in the German periodical *Dingler's Polytechnic Journal*, vol 216, page 250, 1875, on the value of naphthalin and petroleum as substitutes for Cannel coal, by Prof. A. Wagner. It may be of interest, as showing what the Professor has been able to do with these articles in Germany:

The coals in Germany as Saarbrucken, Zwickau, Bohemia, Westphalia, Silesia, etc., etc., do not give sufficiently rich gas by themselves, and are therefore used with an addition of Cannel coal such as Boghead, Bohemian plase coal, Lignite from Falkenau, etc. As a substitute for these innumerable compositions have been proposed, tried, and a large number of patents have been taken out.

All these propositions consist mainly in the addition of such cheap hydrocarbons as will, or should, in the opinion of the patentee be transformed at a red heat into so-called "permanent" gas. "Permanent gas" is here understood as such gas as will not condense at ordinary temperatures, in juxta-position with the permanent gas of the physicist and chemist, who understond the term permanent gas as one applicable to a gas which cannot by compression or great cold, or both combined, be condensed. All these hydrocarbons must be rich in carbon, and the most valuable part of gas. The heavy hydrocarbon burning with a bright flame (olefiant gas, eloyl, C_2H_4) consists of 85.7 per cent. of carbon. The gas made from the common coal contains from 5 to 7 per cent. thereof; with cannel coal addition about 10 per cent. That made from the refuse of petroleum refineries about 17½ per cent.; the remaining portion of the gas consisting of light hydrocarbon CH_4 and pure hydrogen.

John Hamilton's patent, 1867, saturates bituminous shale or other carbonaceous materials with a boiling solution of naphthalin $C_{10}H_8$ in crude coal oil (in proportion of one ton pulverized coal saturated with five pounds of naphthalin dissolved in 110 gallons of heavy coal oil or slate oil, containing much paraffin. From this mixture the inventor states that 420 cubic metres, or 14826 cubic feet of gas have been made.

If naphthalin vapor (93,73 per cent. carbon) could be mixed with the gas, there is no doubt but that the candle power thereof would be sensibly raised.

The formation of a light-giving gas might also be expected, if the naphthalin would change into a gas at a high heat, either by sending the vapor thereof alone, or mixed with hydrogen or light hydrocarbons, through highly heated tubes. But the experiments of the author prove that the vaporization of naphthalin in air is insignificant—6.5 per cent. in nine days, and also that naphthalin and hydrogen, even at a white heat, do not give a permanent gas.

In cerbonizing petroleum it was also observed that an addition of naphthalin was not followed by an increase of the voiume of gas obtained, but that this volume was considerably decreased. It was proved that the vapor of the nuphthalin, which is stable at a red heat, enveloped the vapor from the petroleum in such a manner that a change into permanent gas was prevented, and the petroleum was carried mechanically over.

The experiments proved that naphthalin is not only entirely worthless for the purposes of gas-making, but the numerous bad peculiarities of this body make it very desirable to get entirely rid of it, in order to prevent its interference with the regular working of the works.

The patents of McKenzie, 1865, and those of later date of Walker & Smith, call for an addition of petroleum. The first inventor saturates a ton of powdered bituminous coal with about thirty-three gallons crude petroleum. According to the inventors statement, this should give 1200 or 1460 cubic feet of 18 to 24 candle gas, but an experiment only gave in actual working of the process 9,871 cubic feet. The last named inventors soaked dry peat or similar materials to saturation with petroleum, and obtain according to their statement 9.7 cubic feet per 100 lbs. By warming the crude oil the peat is able to absorb 50 per cent. of its own weight of the oil. The inventors believe that the water produced by the distillation of the peat acts favorably towards the formation of permanent gas, which would be impossible without it.

The idea of producing gas from petroleum by the addition of coal, peat, and other bodies which are by themselves suitable for gas-making, must be called an unhappy one for the following reasons: If a retort is charged with coal or peat saturated with crude oil, in the regular working of the bench, a large quantity of the lighter oils is carried mechanically, by the first developed watery vapor into the hydraulic main, and there lost in the tar, and this watery vapor also prevents the decomposition of the petroleum vapors into permanent gases, and the oils therefore cohdense again only to be lost in the tar also.

The formation of water is completed with coal by the end of the first hour, almost by the end of the first half hour; with peat often in considerably less time. The amount of water formed was with coals from Saarbrucken 10 per cent., bituminous coal 20 per cent., and peat 30 per cent. While the water vaporizes, mostly in the first half hour, there is only such an amount of gas formed, that the latter is often diluted with three or four volumes of vapor or steam.

By peat and some bituminous coals this proportion of steam and gas rises to 12 to 1. In case petroleum has been added to the charge, it is easily seen that a large part of its vapors are carried off undecomposed by the steam, other parts after having formed light-giving gases are again decomposed by the presence of the steam into light hydrocarbons, hydrogen, carbonic oxide, carbonic acid. To prove this the following experiments were made, viz.; A porcelain tube, 30 inches long, filled with pieces of pumice-stone was

heated to a bright heat and the vapor of petroleum conducted through it. The gas passed through a condenser cooled by snow, and was after that collected over water in graduated cylinders. One hundred pounds of petroleum gave about 1150 cubic feet of gas, or 11½ cubic feet per lb. of petroleum. In the condenser was a very small amount of condensed oil.

The same experiment was repeated, with the addition of a slight current of steam entering the porcelain tube together with the petroleum vapor. The result was, 1 lb. petroleum gave 5-88 cubic feet gas, and a considorable quantity of oil floated on the condensed water in the condenser.

According to a patent by Spencer, 1873, heavy gas is made from petroleum, and mixed with steam, driven through red hot tubes and retorts. for the purpose of combining both to lighter gas. The inventor changes the light giving gas obtained from the petroleum, by means of heat and presence of steam, to one of less candle power, for the purpose of obtaining a greater volume of gas, as the petroleum gases combine at a high heat in presence of steam, with compounds such as light hydrocarbons mixed with hydrogen, carbonic oxide, and carbonic acid. But what does the inventor gain thereby? In candle power certainly nothing, but on the contrary he sustains a loss, besides the process requires three fires, one for decomposing the petroleum, one for the boiler, and one for the mixture of gas and steam, without taking into account that the carbon for decomposing the steam can be obtained from cheaper sources than from the gas of petroleum.

According to a further patent by Parker, 1872, powdered coal and caustic lime is mixed with petroleum and caustic lime. Experiment proved that the addition of fresh burnt caustic lime is no advantage, while slaked lime, in consequence of the steam derived therefrom acted to a great disadvantage.

Cormack (patent 1862) distils or carbonizes petroleum, tar, oil, etc., in combination with steam, and *Hazeltine* distils petroleum with steam. Steam proving to be so injurious when present during the production of gas from petroleum, the same may be expected for the carbonization of other hydrocarbon compounds, such as tar, oil, etc. This, apparently, would also account for the numerous failures of the attempt to obtain gas from tar, in combination with steam. If petroleum is to be used at all for the manufacture of gas it is best used by itfelf alone, without any addition whatever.

To the author's knowledge, the pure oil has never been used in any quantity, but only the refuse left from the oil refineries. Two different apparatusses have been mostly employed for this purpose, viz., one of Dr. Hirzel (Dingler 1867, vol. 184, p. 485(and the one constructed by Reidinger. It is xery remarkable, however, that both of these plants produce a very much smaller amount of gas than the small laboratory apparatus of the author produced from crude oil, notwithstanding that experiments on a small scale are not advantageous to quantity. At the locomotive works of Krauss, in Munich, where Hirzel's plant is employed, 7.2 cubic feet of gas were made per 1 lb. of refuse from oil refineries.

The following experiments were made by the author: A carefully weighed quantity of petroleum was placed in a tube of potash glass, one end of which had previously been drawn out to a fine point. This tube was put in a wrought iron pipe, about thirty inches long, filled with pumice stone. The end of the wrought iron pipe where the glass tube with the petroleum was placed, was then securely plugged, and to the other end another glass tube was cemented, by which the gas was conducted to a condensing vessel cooled by snow, thence to a suitable apparatus to collect the gas over water in graduated glass cylinders.

First, that part of the wrought iron pipe containing the pumice stone was heated, when some of the petroleum commenced to evaporate, so that the vapors had to pass the red-hot pumice stone, and gradually the heating was extended along the whole pipe. The oil used for these experiments had previously been freed from all light oils, boiling at less than 150° Celsius. The results are:

First experiment—1.375 grains of oil gave 1.205 litres of gas, or 21.17 grains gas=0.042 cubic feet, or 1511 cubic feet (Rhenish) of gas to 50 kilogrammes, or about 13.9 cubic feet]U. S.) to 1 lb. petroleum.

Second experiment—0.330 grain of oil gave 0.290 litre gas, or 1552 cubic feet (Rheuish) to 50 kilogrammes; about 14 cubic feet (U. S.) of gas to 1 lb. petroleum.

The pumice stone, after each experiment, was covered with a deposit of carbon, which rapidly disappeared at a red heat upon the admission of air. The specific gravity of the gas was 0.82. That of gas made by Hirzel's apparatus from refuse, according to Schilling was 0.86, and at another place according to Martins 0.698.

The candle power was obtained from a burner made for Boghead gas, and found to be by the author, for the gas obtained in the above named experiments, equal to (89.3 grammes steoric acid per •1 cubic foot of gas per hour) 1375.2 grains stearin per 1,0918 cubic feet, or about 1260 grains stearin to 1 cubic foot per hour. The test burner consuming 1375 cubic inches of gas per hour. Schilling found another gas from refuse ef petroleum refineries, equal to 93.66 grammes stearin per 1.092 cubic feet of gas per hour, ar about 1320 grains per 1 cubic foot per hour.

The first condition for making gas from petroleum is to keep up a very high heat, the second that the petroleum vapors shall be exposed to this heat for a time, sufficient to allow their transformation into gas. By employing in the laboratory experiments, instead of the wrought iron pipe above referred to, a porcelain tube glazed inside and out, but of the same length as the wrought iron pipe, the aathor always received less gas, but a considerable greater amount of condensed oils, etc., in the condenser, than when employing the iron pipe. It was impossible to heat the porcelain tube as thoroughly as was shown, by the fact that the glass tube containing the oil had always lost its shape in the wrought iron pipe, but retained it in the porcelain tube; for comparison of the results the porcelain tube produced 3,315 litres gas from 5,251 grammes of petroleum, or 1114 cubic feet from 50 kilos. against 1500 cubic feet from 50 kilos- produced by the iron pipe.

In order to obtain data for the condensation, as well as to obtain the values of the heavier compounds distilling at a higher temperature, the following experiments were made: A small glass retort was cemented to one end of a porcelain tube 30 inches long, to the other end of which a glass tube was attached, about 24 inches long; the end of this glass tube was bent downwards into a condenser cooled by snow, while the porcelain tube, and that part of the glass tube not in the condenser were inclined in such a manner, that any oil not decomposed and condensing in the glass tube, would run back into the red hot porcelain tube.

The retort was charged with 2.94 ounces petroleum, which had previously been freed from all compounds, boiling below 150° Celsius. After the porcelain tube, filled with pumice stone pieces (coarse powdar) had been raised to a bright red heat, the oil in the retort was brought to boiling point. The experiment lasted for 1½ hours, during which time the boiling point of the retort contents rose from 150° to 288° Celsius (from 312° to 550° Fah.). There remained in the retort 0.9534ounces, in the condenser 0.997 ounces accumulated, and there were transformed into gas 0.9907 ounces.

The petroleum employed had a specific gravity of 0.789, the remainder in the retort 0.830, the products of condensation 0.780. While the petroleum employed was entirely free from all compounds boiling below 150° Celsius, fully one half of the 0,997 liquid in the condenser distilled over at a temperature from 140° to 150° Celsius, and from 150° to 190° all except a very small portion distilled over. The formation of such a large amount of light oils, having a considerably lower boiling point than the originally employed oils, proves at least the necessity of thorough condensation.

Of the 0.9531 ounces remaining in the retort, half of it distilled at temperatures between 288° and 369° Colsius, at higher temperatures all except one-fifth, which could not be distilled, but ultimately was transformed into gases. This shows that common petroleum cannot be advantageously used for gas making in Riedinger's apparatus.

In order to find the value of the remainder in the retort, as well as that of the products of condensation for gas making purposes, the following experiments were made: 1.495 grammes =23.02 grains were treated in the above described manner in the wrought iron pipe, which gave 1.125 litres gas (1364 cubic feet per 50 kilos), equal to about 13 cubic feet of gas per 1 lb. of petroleum oil. From the remainder in the retort 1.718 grammes gave 1.305 litre gas (1340 cubic feet per 50 kilos.), or about 13 feet per one pound.

Refined oil gives under the same conditions for 50 kilos., 1541 to 1552 cubib feet of gas, which is considerably more than the products of condensation, or the remainder in the retort developed, which shows the lower value of the refuse f the refiners, as compared with the common oil of commerce for purposes of gas manufacture.

All the gas obtained from petroleum burnt with a very smoky flame when common burners were used, and must be burned from burners having very small openings. Mixed with hydrogen however, it burned with a clear flame, after having passed through red hot tubes, showing thereby its value as an enricher for gas of low candle puwer. For obtaining the commercial valne of petroleum as an enricher and substitute, the following comparisons may be taken:

50 kilos.	Petroleum furnish		1500	cub.	feet of gas.
50 "	Boghead	"	731	"	"
50 "	Bohemian pancraz plates.....)		603	"	"
50 "	Falknau coal	"	575	"	"
50 "	Saarbruck	"	519	"	"

The candle power of 1 cubic foot of gas:

From Petroleum.....	89.3	grammes	stearin.
" Boghead.....	70.	"	"
" Pancraz plates.....	47.	"	"
" Falknau coal.....	48.	"	"
" Saarbruck coal.....	21.	"	"

The light giving value thereof is

50 kilos.	Hetroleum.....	136	kilos.	stearin.
50 "	Boghead.....	51.2	"	"
50 "	Pancraz plates..	28.3	"	"
50 "	Falknau coal....	27.6	"	"
50 "	Saarbruck coal.	10.9	"	"

Or 1 Petroleum is equal to 2.6 Boghead.
1 " " " 4.8 Pancraz plates
1 " " " 4.9 Falknau coal.
1 " " " 12.5 Saarbruck coal.

As long as at present one ton costs (at least in Europe) more than 2.6 tons of Boghead, etc., petroleum cannot be used as an enricher in place of these coals, even in case of the coal from Sarrbrucken, which costs in most parts of Germany more than one ton of petroleum. The 12½ tons of Saarbruck coal furnish eight tons of coke of more than one half the value of the coal, which reduces their cost for gas manufacture to considerable below the one ton of petroleum. The latter cannot therefore be used with advantage as a substitute for Boghead, etc.

NOTE.—50. kilos=110.23 lbs. axoirdupois.
1 cub. foot Rhenish=1.0918 cub. feet. U, S.

nflammability of Coals—Artificial Charcoal.

Different fuels differ widely in their inflammability. Wood charcoal and coke form the greatest contrast in this respect; the former ignites easily and continues to burn, the latter kindles with difficulty and quickly goes out in the air. Gas cokes are more combustible than the coke of metallurgical works; the so-called Saar coke is more combustible than the Ruhr coke. These differences are probably due to molecular arrangement of the particles, to their density, and to their power of conducting heat. The denser the sub

stance, depending as it does on the temperature at which it was prepared, the better conductor of heat and electricity it will be, and the more rapidly will the heat developed at one point spread throughout the whole mass. And, moreover, the denser the substance the fewer points of attack will be offered to the oxygen of the air, and the less heat can be generated in a unit of time at a given point. If heat is applied to a small spot on a large piece of dense (hard, heavy) coal for the purpose of igniting it, a comparatively strong source of heat will be required to bring it to a glow or ignite it. It does not continue to burn after the source of heat is removed, because the whole of the heat is rapidly distributed throughout the whole mass, and the heat newly generated by the combination of oxygen with the glowing coal is not sufficient to keep the temperature up to the burning point. A piece of coke ignited at one spot becomes black almost immediately after removing the source of heat. In like manner a piece of coke ignited throughout its mass, when taken from a stove, soon goes out, because the loss of heat by radiation from the whole surface and by connection with the air, is greater than the heat produced on the surface in the same time by combustion. Even blowing which is employed with wood charcoal to stir up and quicken the flame, with small pieces of ignited coke, hastens its extinction.

The inflammability of coal may be defined to be the ease with which a small piece becomes ignited or reaches its igniting temperature when exposed to a source of heat in the open air, and continues to burn after the source of heat is removed. The igniting temperature itself—*i. e.*, the temperature at which the glowing mass combines with the oxygen of the air—may be considered equal for all kinds of coke. Charcoal burned in pits in the forests, and used in different industries, wherever it is desired to keep a moderate and flameless fire, has different faults, which in many cases are found unpleasant. The chief of these is that incompletely burned pieces (brands) give out a dangerous gas, so that it is impossible to keep a fire in an open space without a pipe to convey the gases into a chimney. Besides this, charcoal sometimes cracks and snaps, throwing out sparks, which renders an open fire dangerous. And further, charcoal is not so easily ignited that a small fire can be started readily unless the coal is first brought to a glow in another fire; nor does the fire spread over the whole mass when lighted at one end, but goes out unless a blast of air is thrown on it, or a number of pieces are piled up together. It is impossible to keep a steady small charcoal fire for several hours in the open air.

Dr. Meidinger, in an interesting paper in *Dingler's Journal*, states that within the last few years there has been introduced into the European market, a prepared charcoal, which is free from these faults, and to a certain extent, may be considered as a new and valuable fuel. The substance burns without smoke, does not throw out sparks; ignited at one spot, the fire spreads slowly over the whole mass, and a perfectly steady fire may be kept for many hours, according to the size of the pieces. As far as is now known this fuel is made of pulverized charcoal, to which is added a small quantity of saltpetre and an adhesive substance like gum. The high percentage of ash (four or five times that of charcoal) indicates that clay is also mixed with it. The oxygen in the salt-petre causes the combustion to continue when once started, and probably renders it smokeless. The products of combustion are not entirely odorless; in our samples there was a characteristic odor of ammonia perceptible. The production of carbonic oxide is not probable, at least so long as a single piece burns in the open air. Some samples evolved the unpleasant stupefying smell which always accompanies the combustion of charcoal. Saward's *Coal Trade Journal*, which publishes the abridged translation whence these particulars are obtained, observes that the author then goes on to state that he does not know who was the inventor of this pressed coal, that he first met with it in 1869 as a French product; that he afterwards obtained some with an English label "combustible stoker." In conclusion, he gives the result of several experiments with different specimens. The caloric effect he puts in one case at about 6,400 units, the specific gravity at 0·8, the price 1 franc for ten pieces four inches long, 1 1-5 in. wide, and three-fifths of an inch thick, weighing 26 grammes. The ash amounted to 12 per cent. Other specimens gave different results.—*Mining Journal.*

Chemical and Scientific Repertory.

Sweet oil rubbed on the skin is said to be a sure antidote for ivy poison.

For cementing glass joints, shellac dissolved in spirit and evaporated to a paste is best.

Fires have been caused in benzine scrubbing by the sparks of electricity, produced during the process, igniting the spirit.

A French author finds that certain flies with rigid probosces often convey infectious maladies, and, among others, carbuncle.

An excellent asphalte is made of two parts of coal tar and one part of pitch, with three handfuls of quicklime to each bucketful.

A putty of starch and chloride of zinc solution hardens quickly, and lasts, as a stopper of holes in metals, for months.

According to the unofficial accounts already published of the brake trials before the Railway Commission, the Westinghouse air-brake gave the best results throughout the series of experiments.

Picric acid dyes leather a good yellow without any mordant; it must be used in very dilute solution and not warmer than 70° F. Aniline blue modifies this color to a fine green.

Yellow stains commonly called iron mould are removed from linen by hydrochloric acid or hot solution of oxalic acid. Wash well in warm water afterward.

To fasten emery to leather, boil glue very thin, add a little milk, raise the pile of the leather, and put on glue with the brush. Then sprinkle on the emery, and let it cool.

To preserve soap-grease, fill a cask half full of good strong lye and drop all refuse grease therein. Stir up the mixture once a week.

Quicksilver in Shropshire—Extraordinary Discovery.—A Shrewsbury publican while digging on thursday in the centre of the town, struck a vein of mineral which proved on investigation to be quicksilver. A sample, consisting of nearly 16 lbs. of pure refined quicksilver, is now on exhibition.

The scenograph is a Belgian invention, in the shape of a small photographic camera mounted on a cane. The negative being prepared beforehand, it is only necessary to take a plant, an insect, or any other object in the focus of the instrument for a minute or so to obtain a correct representation. This can then be developed at leisure.

It is stated that M. Ladyguine has overcome many difficulties which usually attend the production of the electric light. Slender rods of carbon are hermetically sealed in a glass tube from which all oxygen has been removed. It then glows—when connected with a battery—with intense light, in the same way as platinum wire does, but with more brilliancy, and the carbon is not exhausted as when used as the poles of a battery arrangement.

The Aerophore, a French invention, is likely to prove effectual in enabling men to enter mines and other places filled with irrespirable gases. It consists of steel cylinders, filled with compressed air, and which are connected by a tube with the mouth of the miner; the amount of air admitted to the lungs being regulated by a stop-cock. The same apparatus can be connected with a lamp.

Mouth-glue is made by dissolving, with the aid of heat, pure glue, as parchment, glue, or gelatine, with about a quarter or one-third of its weight of coarse brown sugar, in as small a quantity of boiling water as possible. This, when perfectly liquid, should be cast into thin cakes, on a flat surface, very slightly oiled, and, as it cools, cut up into pieces of a convenient size. When required for use, moisten one end. A piece kept in the desk or workbox is exceedingly convenient.

Transparent Pomade.—A French recipe—

Spermaceti	2 ounces
Castor-Oil	5 "
Alcohol	5 "
Oil of bergamot	½ drachm
Oil of Portugal	½ "

Melt together the spermaceti and castor-oil, pour in the alcohol gradually, stop the heat, and add the perfume. Stir well, and pour into glass jars.

A New Adhesive Plaster.—Kauvin recommends a mixture of twenty parts of mucilage of gum arabic and one part glycerine, spread three or four times up on linen at sufficient intervals to allow it thoroughly to dry. This plaster is glossy, pliable, does not deteriorate with keeping, and is considerably cheaper than English or diachylon plaster.

New Meat Preserving Process.—M. Sacc has obtained excellent results by using acetate of soda in powdered form. The meat is placed in a barrel and the acid put in, when it is left for forty-eight hours. Thus prepared, the meat, it is said, will keep for any length of time, and may be prepared for cooking by soaking for 12 hours in water, to every quart of which a quarter of an ounce of sal-ammoniac is added.

Harmless Cosmetic Powders.—The apothecaries of Copenhagen have agreed on the substitution of certain harmless compounds for the numerous poisonous face powders now commonly used. In avoirdupois weight, the proportions of the ingredients will be about as follows: For white powder, oxide of zinc, 1 oz.; wheat starch, 9 ozs.; oil of rose, three drops; for red powder, carmine, 1 oz.; carbonate of magnesia, 4 ozs.

It is being found, says *Iron*, that De la Bastie's glass, which is undoubtedly hardened by tempering, loses its molecular cohesion under a repetition of blows, and then fractures like ordinary glass. Tempered glass, submitted to hammering, presented an appearance on fracture similar to that of *fatigue* steel, a molecular disintegration having taken place. It is feared that this alteration of structure and loss of temper may not only follow from the shock, but may happen spontaneously from interior change in the lapse of time.

Glossed Shirt Bosoms.—Take two ounces of fine white gum arabic powder, put it in a pitcher and pour on a pint or more of water, and then, having covered it, let it stand all night. In the morning, pour it carefully from the dregs into a clean bottle, cork, and keep it for use. A teaspoonful of gum water stirred in a pint of starch, made in the usual way, will give to lawns, white or printed, a look of newness, when nothing else can restore them, after they have been washed.

Silvering Natural Leaves and Flowers.—A very ingenious application of electro-metallurgy has recently been brought before the notice of the Society of

Arts in London. It consists in the application of a coat of silver, by means of electro-deposition, on natural leaves and flowers. By this means very delicate ornaments are produced, since the precise form and texture of the natural leaf is preserved under the thin silver film. The special process under which these results are attained is the invention of a Mr. Denton

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Determination of Sulphur in Coal and Coke.—The following process is given by Eschka, in the *Oesterr. Zeitschr.*, 1874, p. 211: One gram. of the substance is ignited for from three-quarters to one hour, with 1 gram. calcined magnesia and 0·5 gram anhydrous carbonate of sodium, in a platina crucible so inclined as to allow access of air for consuming the carbon, the contents being frequently stirred up for the same purpose. The residue, when cold, is rubbed, while still in the crucible, with from 0·5 to one gram. of nitrate ammonia, using a glass rod, after which the crucible is covered with the lid and again heated for 5 or 10 minutes, when. upon cooling, it is dissolved in 200 c. c. hot water, which is evaporated at 150° C. and filtered. The filtrate is then acidified with a few drops of hydrochloric acid, and the sulphuric acid in the solution precipitated by chloride of barium, and determined as usual.

Gas-Light Intelligence.

United States.

The jury in the case of Martha Hutchinson against the Boston Gas-Light Company returned this morning (October 1st) a verdict for the plaintiff, awarding her $12,500. This is the suit brought to recover damages for personal injuries received at the time of the great fire, in November, 1872, when the building number 11 Summer street was blown up with gas.

In the Grand Palace Hotel, which is now being erected in San Francisco, there will be 9,000 gas-burners, and 30,000 miles of gas and water-pipes. The arrangements for natural will be equal to those for artificial light; there being 1,067 windows, of which 337 are bay windows.

The National Petroleum Gas Company (office, No. 146 Reade Street) has just been organized, with Mr. Wm. Gibbs, President. This company proposes to manufacture gas from crude petroleum, with super heated steam, under the Hanlon patent of December 14th, 1874. Works are in operation at Balston Spa, New York, where the operation may be inspected at any time.

Prices of Gas in America.—The following are the current rates paid for gas by consumers per 1,000 cubic feet:—

Albany	$2.50
Baltimore	2.75
Boston	2.50
Chicago	3.37½
Cleveland	2.50
Concord	3.20
Harlem	3.00
Lowell	2.75
Manchester	2.70
New York	2.75
New Orleans	3.00
Oswego	3.50
Rochester	3.50
St. Louis	3.25
Syracuse	3.25
Troy	3.25
Washington	3.56
Hamilton	3.00
Kingston	3.50
London, Canada	3.00
Montreal	2.60
Quebec	2.80
Toronto	2.50

Gas Fixtures for the New Pacific Hotel in San Francisco.—The Archer & Pancoast Manufacturing Company furnished-the gas fixtures. The order, which amounted to over $60,000, is believed to be the largest single order ever given for similar goods in this country. The gasaliers, brackets, candelabras' etc., are real bronze and gilt. All were made from special designs and are true works of art. Twenty-nine massive 25-light chandeliers were required for the parlors, dining-rooms, ball-room, and corridors, and for superiority of finish and beauty of design they cannot be surpassed. The five-light chandeliers for the 755 private rooms are of a beautiful style recently patented by the Archer & Pancoast Co., and known as the Excelsior Centre Slide or Library Chandelier, which admits of the centre light, with an argand burner, being drawn down to any desired distance. It is very simple and reliable in its mechanical construction, and a new and valuable invention, which renders it at once the most popular chandelier now before the public.—*Frank Leslie's.*

Canada.

The Ingersoll, Ontario, Gas Company, is engaged in the manufacture of gas from wood and petroleum, and is said to do it successfully.

In Hamilton, Ontario, loud complaint is being made of the inferior quality of the gas supplied to the town.

The stock of the Consumer's Gas Company in Toronto is now quoted at 135.

Shares in the City Gas Company of Montreal are selling at a premium of 30 per cent.

A movement is being made for the production of carbonic acid gas in several parts of Canada. The grey iron sand, found in large quantities in Canada, contains, it is said, a large proportion of carbonate of lime. When treated with dilute sulphuric acid, a complete solution of the sand ensues, accompanied by a copious liberation of carbonic acid. As the sand consists chiefly of carbonate of iron, the residue is principally copperas, accompanied by sulphate of manganese, lime and other impurities.

General.

An old gas well near Beaver Falls, Pa., is being utilized in the file works at that town, and is far superior to coal for tempering, as well as cheaper. Although the well has been flowing for years, it still shows a pressure of 90 lbs. to the square inch.

The most Brilliant Artificial Light.—Fill a small vessel of earthenware or metal with perfectly dry saltpeter or niter, press down a cavity into its surface, and in this cavity place a piece of phosphorus; ignite this, and the heat given off melts a sufficient quantity of the niter to evolve oxygen enough to combine with the phosphorus, and the effect is to produce the most magnificent white light which chemistry can afford.—*Photographic News.*

Utilization of Sewage.

The utilization of the common sewage of our towns and cities was thus recommended by the New York *Times* a few days ago. So important a subject should not pass unobserved:

Nearly twenty years ago it was resolved to provide for the metropolis of London a system of drainage that should be efficient in itself and that should at the same time leave the waters of the Thames pure and uncontaminated. During seventeen years, and at a cost of more than twenty-two millions of dollars, the works have been in progress, and it is only two weeks ago or thereabouts that their ultimate completion was announced. The sewage of one large section of London, covering an area of nearly 120 square miles, is now carried away in the most perfect manner, and provision is made by which, for a long time to come, and making all allowance for the continuous growth of the city, the drainage will remain complete.

The great value of the sewage of a large city is fully acknowledged. That of London, with its dense population of four millions, represents a vast annual amount of money. Yet it is not utilized in any degree. By the great system of sewers now completed, it is carried underground to the mouth of the Thames, and there made to flow into the German Ocean. Everybody admits that there is a great loss resulting from such an arrangement; everybody is ready to tell of the national gain that would result if that sewage were utillized upon the land; but nobody has yet been able to devise a means by which in practice it can be done.

A few years ago a company was formed in London for utilizing in this way the sewage north of the Thames, but the idea then was a novel one; at any rate the public had not been educated up to an appreciation of its value, and it fell through for want of capital. In one of the midland counties of England, one of the local boards of health in 1870 took on lease for seventeen years a plot of 28 acres of land with the intention of utilizing the sewage from their own district, which contains a population of about five thousand. The farm was a clay soil, badly cultivated and inefficiently drained. The expenses have been heavy, but still the profits of the experiment are more than encouraging. At first the receipts fell far short of the expenditure. In 1870 the income was only $1,035, barely enough to cover the rent. But every year has shown a marked improvement, and when the accounts were made out for the twelve months ending March, 1875, the receipts were found to be $6,000, as against $2,995 expended. Such a return on a farm of less than thirty acres is conclusive proof that there must be some virtue in this method of culture.

Near Leamington, in Warwickshire, a similar experiment has been tried, but there, the farm being in private ownership, it is not so easy to arrive at the results. It is acknowledged, however, by the Earl of Warwick, to whom the place belongs, that the profits are very large. The Earl pays to the town council of Leamington, $2,250 a year for the town sewage, and he has perfected arrangements for receiving and distributing it over the farm, which is 400 acres in extent, as occasion may require. It is applied to almost every description of crops, from cereals and roots, to beans and peas, cabbage, celery, rhubarb, and even strawberries, and with uniformly favorable results. Rye grass irrigated with the sewage has been already cut five times, and it is expected that at least two additional crops will be secured. The root crops are described as simply enormous; turnips are obtained in perfection continuously through the season, and mangolds have produced as much as 82 tons per acre. It is also worthy of note that the water which flows off this farm is bright and sparkling, absolutely free from all fungoid growths, and quite fit to drink. The farm, the soil of which is a rich loam with a gravel subsoil, has been under experiment four years.

It is not too much to say that the sewage which is every year allowed to flow into the rivers from this city would suffice to make all the land in the neighborhood for miles around, including the now barren flats of New Jersey, highly productive. If means were taken to utilize it, the city would find a new source of revenue, and provisions of many kinds would be cheaper.

Water Supply Works.—The first water works in the United States were planned and constructed by Mr. John Christopher Christenson, at Bethlehem, Pa., in 1762. The machinery consisted of three single-acting force pumps, of four inch calibre and eighteen inch stroke, and worked by a triple crank, and geared to the shaft of an under-shot water wheel, eighteen feet in diameter, and two feet clear in the buckets. The water was raised by this machinery to the height of 70 feet, and subsequently to 114 feet. The works were in operation as late as 1832. The first rising main was made of gum-wood, as far as it was subject to great pressure, and the rest was of pitch-pine. In 1789 leaden pipes were substituted, and in 1813 they were changed for iron.

Correspondence

[Correspondents, in all cases, should sign their communications with their names and address in full—not necessarily for publication, but as a guarantee of good faith.—ED.

Some Foreign Street-Loss Accounts for 1874.

SAN ERANCISCO, Sept. 30, 1875.

Mr. Editor: The following figures and facts, compiled from the *London Gas Journal*, may posses interest for your readers. They are all from official returns;

I. *London Companies.*

	Street Loss.
Ratcliff	5½ per cent.
Phoenix	6¾ "
Crystal Palace District	7½ "
Imperial	7½ "
South Metropolitan	8 "
Chartered	9 "
Commercial	10½ "
London	12 "
Average of 8 London Co.'s	8⅜ "
Maximum	12 "
Minimum	5½ "

II. *Companies outside of London.*

Birmingham	5 "
Portsea	5 "
Bath	5½ "
Leeds	5⅞ "
Galashiels	7½ "
Bombay	9¾ "
Berlin	10 "
Shanghai	10 "
Halifax	11 "
Worthing	11 "
Singapore	12 "
Carmarthen	14 "
Cagliari	14 "
Barton	14 "
Alliance (of Dublin)	19 "
Glasgow (Corporation)	19 "
Average of 16 outside Co.'s	10¾ "
Maximum	19 "
Minimum	5 "

The above returns are not selected, but embrace all that I have been able to find in the official reports published in the *London Gas Journal* for 1875 to date.

REMARKS.—The little *Ratcliff*, making only 300 millions per annum, and recently consolidated with the Commercial, shows but 5½ per cent street loss; although its mains surround the docks, and are therefore subject to vibration from the heaviest traffic. It sold over 9.400 feet out of the ton during 1874.

The *Phoenix* lost prior to districting over 30 per cent. It new loses 6¾ per cent., and increased its ton sales, 1874 over1873, by 200 cubic feet.

The *Surrey Consumers'* (London) increased its ton sales, 1874 over 1873, by 800 cubic feet.

The *Imperial* sells 9,000 cubic feet out of the ton.

The *Chartered* makes 12½ millions per day during the winter, at its Beckton station alone. It has, practically *no* leakage on its leading 48-inch main from Beckton to Notting Hill. It sells over 9,000 feet out of the ton. It increased its ton-sales, 1874 over 1873, by nearly 800 feet; and has reduced its street loss, first from 23 to 16 per cent., and finally, from 16 to 9 per cenl.

The *Portsea Island* gas works reduced its street loss from 11 per cent. in 1869, to 5 per cent. in 1874; its total make for 1874 being 256 millions.

The *Leeds* company has reduced its loss from 24 per cent. down to 5½ per cent.

At *Shanghai* the loss was 13½ per cent. in 1873, and 9¾ per cent in 1874.

At *Carmarthen* some of the mains are fifty-two years old. (!!!)

Methven, (*London Journal of Gas-Lighting*, Feb 24, 1874) referring to a small gas work, says that the reduction of leakage is a very expensive as well as difficult operation. Five and a half miles, varying from eight inches to two inches were examinod and repaired; the work occupying eight weeks, and costing about £50 per mile.

The leakage before the repair of the mains was 450 cubic feet per hour, and after the repair was 85 cubic feet per hour; the pressure in each case being 23 tenths.

The following statement, for corresponding quarters in two successive years, before and after repair, shows that something more than temporary benefit was effected.

A. 1872. BEFORE REPAIR.

Gas regis'd by station meter,	4,136,000	c. f.
Gas sold	3,183.000	"
Balance, street loss	953,000	" =23 p. c
Gas made per ton	9.400	cub ft.
Gas sold "	7,250	"
Street loss	2,150	"

B. 1873. AFTER REPAIR.

Gas regis'd by station meter,	3,606,000	c. f.
Gas sold	3,290,000	"
Balance, street loss	316,000	" =9 p. c.
Gas made per ton	9,200	cub. ft.
Gas sold "	8,400	"
Street loss	800	"

Of the amount lost during 1873, only 100,000 cubic feet were to be expected from the reduced hourly rate of 85 cubic feet first mentioned- "Where have the 216,000 cubic feet of gas gone!" "There are 750 main and lamp cocks in the district; 600 meters, a large part of which are dry and have been badly used; and lastly an old gasholder, which may be debited with the loss, without indulging in theories about 'exosmose,' 'endosmose,' 'condensation,' or 'difference in temperature."

The same writer gives (*London Gas-Light Journal*, March 24, 1874) the case of a gas work, where the leakage was reduced during seven years' attention from 29 to 16 per cent, by the use of lamp governors, the overhauling of the mains, and the examination of services and of fittings outside the meters. The street loss per mile per annum was 240,000 cubic feet.

D. A. Graham (*London Gas-Light Journal*, April 14, 1874) thus gives what he calls "*An excellent receipt for ruining a gas company.*—Purchase what are termed cheap coals, spend as little as possible on the repairs of retorts. and do not trouble yourself about leaky mains or services."

Shadrach Studholme (*London Gas-Light Journal*, August 18, 1874, after eudorsing Methven, says "I could give instances where, with a four-inch pressure, we have reduced a leakage of from 30 to 50 feet per hour to from 3 to 5 feet per hour, per 100 yards of mains."

He proposes stripping the main in sections, and testing each section separately bp a proving gasholder and test meter, adding that "it is a kind of work which requires time, patience, perseverance and money; but money so spent is well laid out, and will soon repay itself.

Very truly,

JAMES R. SMEEBERG.

Letter from Mr. Neal.

CHARLESTOWN, MASS., Oct. 9, 1875.

Mr. Editor: I have just received a copy of the last issue of the "Journal," containing my report of the proceedings of the semi-annual meeting of the New England Association of Gas Engineers, held in Providence in August last.

My name should have been appended to the report, but I find that I neglected to append it to the copy which I sent to you for publication.

The report is an exact copy of my record, and was intended to be official.

I consider the columns of the AMERICAN GAS-LIGHT JOURNAL to be the best medium through which to convey to the members of the Association who were absent from the meeting—and others—information concerning what was said and done on that occasion. The report gives but a very brief abstract of the discussions, but I think all will admit that it would be impossible for me to give from memory a full report, or even a very partial one, which would do justice either to the various subjects considered, or to the remarks of those who took part in the discussions. If you have not already done so, please send to every member of our Association, who is not a subscriber to your paper, a copy of the same containing said report.

I have endeavored to enlarge your subscription list, being convinced that the greater the number of its patrons the better will be the "Journal," not only as a medium for advertising whatever may be employed in the manufacture, storage, and distribution of gas, but also as a source from which may be derived a vast amount of information both valuable and interesting to all those employed in the management or supervision of gas works, or otherwise connected with gas companies throughout the country.

I trust that more interest will now be taken in the welfare and success of your paper, and that articles on subjects interesting to the gas fraternity will be furnished from time to time by those, of which, I am happy to know, the number is not small, who are highly competent, both from information acquired by reading and observation, and from actual experience and experiment, to impart to their brethren much that is useful and important for them to know. If it should be found necessary to make room in your paper for such additional matter, I think you would not object to adding a page or two to the same.

GEO. B. NEAL,
Sec. New England Association Gas Engineers.

Cheap Remedy for Naphthaline.

[We have received the following from a correspondent, who states that he has been using the methods he describes for over a year, and that it has proved successful in every case.—ED.]

October 8, 1875.

Mr. Editor: A cheap and reliable remedy for naphthaline can be found by using crude petroleum, in either of the following methods:

1st. By mixing crude petroleum with slack or fine nut coal until it will bear handling, without showing any sloppiness in the scoop, throw in a scoopful of the mixture with each charge, but let it be the last scoopful; it is easier to handle than rosin. Use about one gallon of petroleum to every five thousand feet of gas made.

2nd. Make a half inch hole in the upper part of the retort cover, which hole you keep plugged with fire clay until wanted. Next you have a funnel of, say two gallons capacity, attached to the highest arm of a ∪ pipe, at a right angle; to the lower arm connect a ⅜ or ½ inch gas pipe of four feet in length—attach to this a stop cock. To the stop cock attach about six feet more of pipe; have the end of this pipe worked down to leave only about 1-16 inch opening. When the charge is about four hours burned, run the pipe through the hole in the cover about five feet into the retort; fire-clay round the hole and pipe, have the stop cock turned off, put a gallon of crude petroleum into your funnel, turn on your stop cock; manage so that it will take about thirty minutes for the gallon to run off, soon as run off *turn off* the stop cock, as there is fire in the retort end of the pipe, withdraw the pipe and plug the hole in the cover.

In this method it is expedient that there should be *no* back pressure.

Use as in former method one gallon petroleum to every five hundred feet made.

This method gives a much better yield of gas, and manifestly improves the candle power of coal gas. Street lamps and services are not liable to be frozen while there is any petroleum gas associated with the ordinary coal gas.

X.

A Request.

SAN FRANCISCO, Sept. 25, 1875.

Mr. Editor: You will do me a favor by publishing the following request to American gas-makers generally, my apology for asking the use of your columns being the enormous clerical work which individual letters would involve.

The replies will be held strictly confidential, and those replying will lay me under personal obligation, which I shall endeavor to cancel by some similar service or other.

The data I wish *sent to my address* relate to the important subject of street loss, and are as follows, viz.;

1st. Gas sold to consumers' meters and public lamps per ton (2240 lbs.) carbonized.

2nd. Gas registered by the station meter per ton.

3rd. The probable point of greatest loss, whether mains, services, or slow registration by consumers' meters.

2th. Which meter is preferred, wet or dry?

5th. Describe your procedure for reducing street loss.

Trusting you may deem it proper to publish this, I am Yours respectfully,

JAMES R. SMEDBERG.

Cost of the Brooklyn Bridge.

STATEMENT OF RECEIPTS AND EXPENDITURES TO DATE —CONSTRUCTION OF THE TEMPORARY CROSSING TO BE BEGUN IN JUNE NEXT.

A meeting of the Directors of the New York and Brooklyn Bridge Company was held yesterday at the office of the company in Water street, Brooklyn. There were present Henry C. Murphy, President; Lawrence Turnure, Jenkins Van Schaick, James M. Motley, F. B. Thurber, W. C. Kingsley, Mr. Marshall, H. W. Slocum, J. S. T. Stranahan, Mayor Hunter, and Controller Powell. The Treasurer's account for the month of September showed the total receipts for the month to be $702,512. The total expenditures were $76,630. The following statement of the financial condition of the company up to the 30th of September was then read:

CASH RECEIPTS.

From the City of Brooklyn	$3,800,000
" " New York	1,500,000
From private parties	349,800
For rent	37,982
Material sold	59,531
Interest	40,413
Horses and harness sold	1,370
Wharfage	3,665
Total	$5,792,762

CASH EXPENDITURES.

For engineering salaries	$ 225,645 44
For rent	53,899 16
Office expenses	61,117 52
Timber and lumber	380,158 20
Construction	1,041,602 36
Contingent expenses	14,922 56
Tools	17,702 15
Labor	825,555 93
Machinery	121,739 38
Freight, cartage and towage	22,928 75
Printing and advertising	5,471 48
Land, land damages and buildings	1,056,866 61
Limestone	486,694 00
Granite	1,314,956 79
Interest and discount	27,789 27
Horses, wagons and harness	7,518 26
Insurance	3,794 57
Scows and repairing	29,533 01
Losses on New York City six per cent. bonds	9,296 00
Loss on New York City seven per cent bonds	3,509 18
Office furniture	5,933 90
Taxes	14,044 74
To Collins Granite Co on account	9,512 55
Total	$5,740,071 73

LIABILITIES.

Collins Granite Company, percentage.	$ 1,959 03
Nome and Madden	4,082 60
Edgemoor Iron Company	1,477 85
Beattie & Dresser	1,541 29
Keystone Bridge Company	640 95
Certificates of indebtedness	447,808 36
Total	$457,510 08

In reply to one of the members of the board, Mr. Murphy stated that the cost of the land required to be purchased between the anchorage and the terminus on the New York side would be about $470,000, and on the Brooklyn side $130,000, making a total of $600,000. He also stated that by the 1st of June next they would be ready to commence the erection of the temporary bridge across the river. The wire for this structure will cost about $50,000, and it will require about four months to complete it. The wire used will afterward be employed for guys on the main bridge. After transacting some routine business the meeting was adjourned.

The New York anchorage will take up nearly half of the block bounded by Cherry, Water, Roosevelt and Dover streets. The base of the anchorage is 141x120 feet, and the structure will rise 80 feet above the sidewalk on Water street and 65 feet above the Cherry street sidewalk. It will consume 500,000 feet of timber and 30,000 cubic yards of stone. The weight will be 60,000 tons. Four large warehouses, three stores and several tenement houses had to be removed to make room. The structure is raised by courses, the bottom course being of timber and concrete. The timber is Georgia or Florida pine, 12x12 inches, put in layers, alternately lengthwise and crosswise, and firmly bolted together, the timbers in each layer being from two to six inches apart, and the interspaces filled up with concrete. This bottom wooden course is already down, and one course of stone, two feet deep, is laid over it. It is expected that the structure will be completed in about a year.

The distance from the southern face of the anchorage to the center of the great pier is 930 feet, and it is 1300 feet from the northern face of the anchorage to the end of the approach on Printing House Square. The anchorage will receive four cables, descending from the top of the tower and entering the anchorage about 70 feet from the ground, so that they clear the roofs of the tallest buildings that stand in their line. These cables will be 16 inches in diameter, made of steel. They enter the anchorage horizontally, and run along through tunnels a distance of 25 feet, when the strands, of which there are 19 in each cable, separate, and each strand takes hold of two links of a loop of chain, which makes 38 links to receive one cable. The two cables thus merge into 4 great chains which pass on through the anchorage in a curved line until they reach the bottom and are made fast to the plates put there to receive them. These four plates are of cast iron, 17½ feet long by 16 feet wide, each weighing 23 tons. The top surface is flat and the bottom convex. The great stones above the plates overlap each other in such a way that the anchor plates cannot rise without carrying up the whole mass.

Mr. C. Martin is the assistant engineer in charge of the New York approach, and Mr. T. Collingwood is the engineer in direct charge of the construction of the anchoaage.

The Brooklyn anchorage is completed and waiting for the cables and for the completion of the New York tower. Nothing but the cap stones are wanting to the Brooklyn tower, and these will wait the stretching of the cables. The Brooklyn anchorage is in the square bounded by Fulton, Front, Garrison and York streets, and is at present concealed from the general observation by the buildings which surround it, and which are to be pulled down as soon as the New York tower is ready for the cables. Cable making will be begun at once on the Brooklyn side. Derricks will be raised on the top of the anchorage, which will be entirely roofed in under a spacious shed, and there this part of the work will be carried on through the fall and winter.—*Iron Age.*

Natural Gas at Chatillon (Haute Savoie), France.—The soil beneath this place is impregnated with carburetted hydrogen gas from some subterranean source, a bore hole driven to the depth of only one meter yielding a fair supply of gas which will burn five or six hours. Attempts are being made to utilize it for processes of illumination.—*American Engineer.*

Products of Distillation of Coal.

The following list contains most of the compounds generated by the distillation of coal:

	New atomic weights.
Hydrogen	H
Water	H^2O
Carbonic oxide	CO
Carbonic acid	CO^2
Sulphurous acid	SO^2
Hydrosulphuric acid (Sulphuretted hydrogen)	H^2S
Bisulphide of carbon	CS^2
Hydrocyanic acid	HCN
Hydrosulphocyanic acid	HCNS
Acetic acid	$C^2H^4O^2$
Carbolic acid (Phenol)	C^6H^6O
Cresylic acid (Cresol)	C^7H^8O
Phlorylic acid (Phlorol)	$C^8H^{10}O$
Rosolic acid	$C^{20}H^{10}O^3$(?)
HYDROCARBONS.	
Methane (Marsh-gas)	CH^4
Sextane (Propyl)	C^6H^{14}
Octane (Butyl)	C^8H^{19}
Decane (Amyl)	$C^{19}H^{22}$
Duodecane, (Caproyl)	$C^{12}H^{26}$
Paraffin	$C^n H^{2n} +^2$ (?)
Ethene (Olefiant gas)	C^2H^4
Tertene (Propylene)	C^3H^6
Sextene (Caproylene)	C^6H^{12}
Septene (Enanthylene)	C^7H^{14}
Ethine (Acetylene)	C^2H^2
Benzol	C^6H^6
Toluol	C^7H^8
Xylol	C^8H^{10}
Cumol	C^9H^{12}
Cymol	$C^{10}H^{12}$
Naphthalin	$C^{10}H^8$
Anthracene	$C^{14}H^{10}$
Phenanthrene	$C^{14}H^{10}$
Fluorene	$C^{13}H^{10}$
Pyrene	$C^{16}H^{10}$
Crysene	$C^{18}H^{12}$
BASIC NITROGEN COMPOUNDS.	
Ammonia	H^3N
Aniline	C^6H^7N
Pyrodine	C^5H^5N
Picoline	C^6H^7N
Lutidine	C^7H^9N
Collidine	$C^8H^{11}N$
Parvoline	$C^9H^{13}N$
Corindine	$C^{10}H^{15}N$
Rubidine	$C^{11}H^{17}N$
Viridine	$C^{12}H^{19}N$
Chinoline, Leucoline	C^9H^7N
Lepidine	$C^{10}H^9N$
Cryptidine	$C^{11}H^{11}N$
Pyrrol	C^4H^5N

Exhibition of the Keely Motor.

The Philadelphia *Times* of the 4th inst. says:

"Vice Admiral Wellesley, of the Royal Navy, whose splendid iron-plated ship, H. M. S. the *Bellerophon*, is lying in Newport Harbor, arrived at the Continental from Washington on Saturday night, *en route* for New York and Newport. He was accompanied by Captain Gore Jones, also of the Royal Navy, attached to the Briti h Legation at Washington. These two distinguished foreigners, by pre-arrangement with Mr. Keeley, of Keeley motor notoriety, rested in Philadelphia yesterday, in order that they might attend on Saturday night a private exhibition of the Keeley motor at the inventor's house on Ridge avenue. Besides these gentlemen there were present, by special invitation, to witness the display of Mr. Keeley's powers in the direction of a new motor, Dr. B. Howard Rand, the distinguished professor of physics and chemistry in the Jefferson College of this city; Wm. H. Rutherford, Chief Engineer of the United States Navy; Evan Randolph, of the firm of Randolph and Jenas; Alexander B. Todd, nephew of Prof. Rand, a bright young student, who bids fair to become a first class mechanical engineer; Chas. E. Sherman, attorney-at-law, from Washington; Boyd Elliot, a mechanical engineer, of New York; W. W. Harding, proprietor of the *Inquirer*, and a representative of the *Times*, and several others connected with the Keeley Motor Company, either as counsel or as stockholders.

☞ *For other reading matter see page* 150.

THE AMERICAN GAS-LIGHT JOURNAL AND CHEMICAL REPERTORY

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☞ All communications to be addressed to **"The Proprietors,"** No. 42 Pine Street, Room 18, New York.

SATURDAY, OCTOBER 16, 1875.

WISHING TO MAKE THIS JOURNAL an organ of intelligent discussion to those of our readers who may wish to gain or give information on the subjects to which its columns are devoted, the publishers solicit letters from all among them who make the study of these subjects a pleasure, or a profession.

Subscribers would confer a favor upon us by remitting *CHECKS*, or *POST OFFICE MONEY ORDERS*, as we are frequent losers where money is enclosed in letters.

☞ NEWS AGENCY.—The American News Company, 11 and 121 Nassau street, New York agents for this Journal. News dealers will please send orders to them.

NOTICE.

☞ *All Collections for Advertisements, Subscriptions, etc., are made directly from this Office. We have Agents to solicit the same, but they are not authorized to Receipt for Money.*

TO OUR SUBSCRIBERS AND PATRONS.

In making remittances for subscriptions, always procure a draft on New York, or a POST OFFICE MONEY ORDER, if possible. Where neither of these can be procured, send the money, but always in a REGISTERED LETTER, The registration fee has been reduced to eight cents, and the registration system has been found by the postal authorities to be actually an absolute protection against losses by mail. ALL Postmasters are obliged to register letters whenever requested to do so.

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THIRD ANNUAL MEETING OF THE AMERICAN GAS-LIGHT ASSOCIATION.

The Third Annual Meeting of the American Gas-Light Association will be held on the 20th of this month. Headquarters for the members will be at the Hoffman House, corner of Broadway and 25th Street.

The meetings of the Association will be held at the Masonic Rall, corner of Twenty-third street and Sixth Avnue—First meeting, October 20th, 10 A. M.

We would respectfully urge upon all interested in gas matters the importance of making this society what it should be, and what it is intended by its active promoters it shall be, viz. : A means of collecting and disseminating useful facts and information, upon what has been done in actual practice, as well as to bring the fraternity together, that they may compare notes, etc., and each form his own judgment, as to what manner of men the others are from personal acquaintaince. Of course the success of any such association must depend upon the members themselves, and in order to make the National Association of America second to none, at home or in foreign lands, we trust that *all* will take an interest, and show it by their presence, and the influence which the best minds in the business must have upon the proceedings and discussions.

EDITORIAL GREETING.

In assuming the position of Editor of the GAS-LIGHT JOURNAL, it is with great diffidence and deference that we would make a few suggestions as to what may be, so far as our efforts can be foreseen, the course to be pursued in the conduct of the Journal.

Fully realizing that the gas interest is one of some magnitude in this country, and that in all probability it must continue to increase as our country develops and her population increases, it shall be our first endeavor to do all that we can to promote the best and true interests of all concerned, in the manufacture, sale and consumption of illuminating gas. It is a legitimate business, based upon certain fixed principles, and we hope to be able to place before our readers, from time to time, such information as may be of use to those engaged therein—not claiming by any means that it is original, but taking it from whatever sources may be available, and crediting the same therewith at the same time. And we hope to give from time to time such items in engineering in general as may be thought to be of service; and, as regards gas engineering in particular, we hope eventually to make our paper a standard.

And here we would beg to enunciate one proposition, viz.—That whatever is for the real, substantial and permanent interest of the manufacturer, is for the best interest of the consumer. No one can reasonably expect that the fixed and unalterable laws of supply and demand are going to fail to apply to the business of gas-making and selling any more than to any other. For a time there may be an apparent monopoly, but if injustice is done on either side, the matter will sooner or later be corrected. The cheaper the article the more consumers and the more universal its use.

It is honestly believed that whatever conduces to disseminate knowledge of correct principles and facts among those whose special business it is to make gas, is of service alike to consumer and maker. What the consumer wants is better light for the same money. What the maker wants is to get more gas, of equally good quality, at the same or less expense of manufacture. Now we wish it distinctly understood that the effort of this Journal will be to disseminate *useful* information. It is our intention to make it a medium through which those interested, either directly or indirectly, in the subjects of which it treats, may both *give* and *receive* light. It is, to a great extent, in the hands of the fraternity itself to make it a success in this regard, and all are most earnestly invited to make use of its columns, either in giving others the benefit of facts gained by individual experience, or in seeking information on any particular points where difficulties may have arisen. *Facts* are stubborn things sometimes, but if properly analyzed and applied, may be of great benefit.

It is taken for granted that no one in the gas business has arrived at that point where he "knows it all," or, in other words, where he can learn no more.

An exchange of experience, and an honest, truthful statement of facts may lead to more useful results than anything else; and it is in this view that all are invited to contribute to our columns.

It is the earnest desire of both the Proprietors and Editors of this paper, that it should become the organ of the regular gas business; and it shall be our endeavor to give to those interested in the business the benefit of every improvement that may be shown to be of real practical utility, and to avoid as far as possible the advocacy of any and all schemes of a doubtful or merely empirical character; in other words we will try to satisfy ourselves of the true merit of whatever may be presented. And while we hope that all who think they have improvements, will give the world a chance of knowing exactly what they are through our columns, at fair rates, we trust that we may be pardoned if we do not endorse them until a fair trial and thorough investigation have shown them to be of real value. Fairness to all, and a careful study of the underlying principles involved, will, we trust, put this department of our paper upon a basis at once honorable and useful.

In the Department of Hydraulic Engineering it is hoped that we may lay before our readers, from time to time, such matter on the subject of water supply and distribution, as may be obtained from all sources within our reach. This is a subject of no little importance, and there are so many common points of interest in the business of gas and water supply, that we trust much of this information will be useful to those interested in both. We hope that our friends will bear in mind that it costs but little more to issue a large edition than it does to issue a small one, and should our efforts be crowned with moderate success, in meeting the wants of those for whose benefit it is issued, we earnestly trust that they will spare no effort in increasing its circulation. The annual subscription is small and brings it within the means of all. It is our aim to make the paper *reliable* above all things; and we trust that all who may favor us with information, will be careful to discriminate between facts and rumors in making statements.

Following the dictates of practical common sense, with a strict adherence to fundamental principles, let them lead where they will, must result in benefit to all.

LITERARY CRITIQUES.

In this department the GAS-LIGHT JOURNAL will give a succinct and impartial notice of books

pamphlets, periodicals, etc., etc., sent for review. The object will be to inform our readers of the current literature of the age, and to indicate such works as it may be desirable for them to possess or peruse. Those which bear specifically upon the objects of the Journal—which relate to the principles, history, or interests of gas manufacture, or to cognate subjects in chemical and other sciences—will receive detailed notice, or critical analysis; whilst others of minor importance will be promptly acknowledged, with an intimation of their title and contents. Whether or not we can endorse all the sentiments they enunciate, or commend the general object and tendency of their works, neither authors nor publishers shall have occasion to complain of a want of candor in criticism, or courtesy in tone.

The first work now before us is a handsomely gotten-up volume of nearly two hundred pages. It is Part I *of Engineers' and Mechanics' Tables*, by P. Munzinger, and is filled with statistical information of a valuable kind. As stated by the author himself, his object has been to supply a text book to engineers, contractors and managers of gas works. The materials of which the work is composed have been gradually accumulated during years of research and calculation upon weights, and the specific gravity of various bodies. In the first instance the results of these researches were collected as a guide to the author himself in the construction of gas works, etc.; and judging wisely that what had proved of personal benefit might in like manner become useful to those whose tastes and studies were like his own, and whose investigations might be aided by his labors, he resolved upon their publication. In the preparation and publication of his work, Mr. Munzinger has performed a useful service. His enquiries have been patient and minute, and their results are presented with a clearness and detail which at once command them to attention. In a few cases explanatory notes might have proved an additional advantage, both to the general and professional reader; but as a compendium of figures, carefully arranged, on weights and measures, etc., the work is specially interesting and valuable; and as such, we can only hope it may find its way into the hands of those for whom it is specially intended, and to whom it may be of pratical advantage.

II. Two useful pamphlets have been received from Mr. W. W. Goodwin, gas meter manufacturer, Philadelphia. The first is an essay "on methods for determining the density and specific gravity of coal gas," and contains in a small compass a large amount of valuable information. In his own words, the aim of the author has been to present in as concise a form as possible, consistent with a proper understanding of the subject, the principles and the several methods in use for the purpose, and to suggest means for determining the density and specific gravity of coal-gas, by what is known as the effusion method. It is not too much to say that Mr. Goodwin has fulfilled this intention with credit to himself; and, as the result, his pamphlet is worthy of general circulation and perusal.

The second pamphlet is a larger and somewhat more pretentious work, bearing on the "quantative estimation of sulphur and ammonia in coal gas." Although according to the author, it is an easy matter to determine the *presence* of ammonia and sulphur in coal gas, the determination of the *quantity* is more difficult. The object, therefore, is to supply the information necessary therefor. In doing this Mr. Goodwin first of all gives some very useful hints for the laboratory, and then lays down a series of general and necessary principles. These are followed by remarks on weights and measures used in volumetric analysis; and these again by an application of the principles and rules for the determination of the quantities sought. In the preparation of his treatise the author acknowledges obligation to several popular works, to which reference is made. The pamphlet is worthy of attention as well for the style in which it is written, as for the information it conveys.

Mr. D. Bruce Peebles of Edinburgh, Scotland, is in New York. Mr. Peebles is a Gas Engineer well-known in England and Scotland, as the inventor and manufacturer of gas apparatus of various kinds. His efforts in the direction of securing a governor or regulator for the pressure upon burners have been very successful. They are applied either to the service pipe attached to the meter, or to the burners themselves. They have been applied to street lamps in Glasgow, with a saving of about £6,000 per annum, giving at the same time an improved light and a constant pressure.

Mr. Peebles is about introducing his governors in America.

☞ We would respectfully call attention to the translation from Dingler's Journal, on the subject of naphthaline and petroleum as enrichers, to be found in another column. As a statement of results obtained by Professor Wagner, it must be of interest to most of our readers.

NOTICE.

AMER. GAS-LIGHT ASSOCIATION

Office American Gas-Light Association,
117 Broadway, N. Y. City.

THE THIRD ANNUAL MEETING OF THE ASSOCIATION will be held in the **CITY OF NEW YORK,** on the **20th of October, 1875,** for Election of Officers, and other business incident to the Annual meeting. All Members of the Association are earnestly requested to be present.

Every Gas Company is invited to become connected with the Association, by having one or more of its Officers, Engineers, or Superintendents, become a member.

Individual Managers of Gas Works, and all persons practically skilled in the Construction and Management of Gas Works are also invited to join the Association.

CHARLES NETTLETON, Secretary.

GEO. W. DRESSER,
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TO GAS COMPANIES, AND CITY GOVERNMENTS.

DYOTT'S PATENT
CHAMPION STREET LAMP

Doubles the Light with the same quantity of Gas used in other Lanterns. *All others* waste half their light, illuminating the sky, or if the top s of metal, absorb it.

Single Top Glass Lamps both Globular and Square become heated if a good light is put in them, and rain, hail or snow falling upon the heated glass breaks it. When one glass is broken the wind will either blow the flame against the others and break them, or destroy the entire Lamp. *Nine-tenths of the breakage and cost of repairs of other* street lamps is owing to that cause.

Dyott's "Champion" is the only double top—the only Lamp that has the Opaline White Dome, which is a *never changing reflector;* it doubles the power of, and throws the light to a greater distance. It is also a perfect *protector,* shielding the heated top or the lamp from all inclemency of the weather. The white dome is kept cool by the passage of air between it and the transparent globe below. Rain, hail or snow will never break either the globe or dome. The globe rests upon rubber cushions, and is supported laterally by elastic springs, so that contraction or expansion of the globe, or jarring of the post will not break it. They can be cleaned in one-fourth the time required to clean other lanterns. The metallic portions are of iron, copper and brass, and are the most durable, economical, efficient and cheapest lamps in existence. For public buildings, and wherever an ornamental and powerful light is required, they are made in clusters of 2, 3, 4, 6, 7 and 10 lamps, which have no equal in this or any other country for *beauty, durability, efficiency* and economy, either in cost, use or ornamentation. Designs furnished when requested for specific purposes. Gas companies, or those who have the lighting of Cities in charge, are solicited to communicate with us in reference to the agency for its introduction.

The Franklin Institute has awarded our Champion Lamp the highest premium: (they give a silver medal) and its Committee on Science and the Arts has recommended it as the best lamp in use. It has also invariably taken the highest premium at every Exhibition at which it has been presented, and elicits the strongest commendations wherever it is used. We have several new and handsome patterns of Posts for Corporations, Parks, public and private use, also for clusters of lamps, that are not excelled in beauty or price at which they are furnished.

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To Gas Companies.

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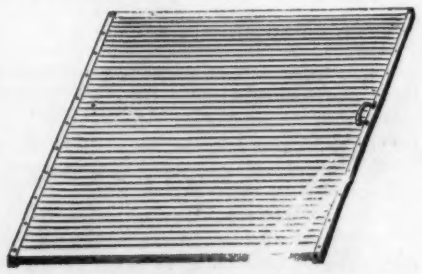

The above Trays are made from half inch to one and a quarter inch thick with a strong centre piece, bars bevelled on top. Also the Diamond Bar Tray can be used either side up; smoothest and most durable Trays in use. They are now used by more than three hundred Gas Companie in the United States and other places.

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PARTIES DESIRING THE SERVICES OF a thoroughly competent GAS WORKS SUPERINTENDENT, will please address "C," Box 997, P. O., N. Y.

The crowded state of our columns this morning forbids anything more than the merest passing notice of this meeting and the manifestations of Mr. Keeley's apparently startling power. Whether this power is exerted, as he claims it to be, upon certain hitherto unknown and undeveloped forces of nature, or whether it is to be found cleverly concealed under the tricks of the charlatan or in the consummate ingenuity of the mechanical engineer, it is not the province of the writer to speculate upon. But certain it is that Mr. Keeley showed to the satisfaction of all that he had the power of producing in a few moments and out of the simplest elements a very considerable elastic force, so great, indeed, that being applied to a large lever heavily weighted the unprecedented pressure of 1,750 pounds to the square inch was indicated by the gauge. But as this force was not continuous in its action, as was shown by the fact that the gauge declined from 1,750 pounds to 500 pounds in half an hour, the suggestion was significantly made by one of the British naval officers that possibly this force could not be made constant, and therefore would not be calculated to do actual "work." To be sure Mr. Keeley answers that as soon as he gets his new machine, the last piece of which is promised by the 10th instant, he will be enabled to renew this mysterious and enormous power, and, indeed, increase it forty-fold if necessary; but this assurance rests for its fulfilment on the future, and until that comes, with its fruition or its failure, it would be best to say nothing which would tend either to depreciate or enhance the merits of the "Keeley Motor."

In conversation with Admiral Wellesley (who, by the way, is a grand nephew of the "Great Duke") and Captain Gore Jones, they declined to express any opinion, "for the simple reason that we know nothing about it. We simply see certain results, and are unable to account for their mode of production, but we confess that thus far the practical usefulness of the invention rests in the domain of the ideal."

That which most impressed the Admiral was the absence of any evidence that the power could be made constant and continuous.

Sulphur in Coal-Gas.

At the recent meeting of the British Association for the Advancement of Science, Mr. Vernon Harcourt, president of the chemical section, described an apparatus for the estimation of sulphur in coal-gas. By the present system of gas-making it seems impossible for gas manufacturers altogether to prevent sulphur, in the form of bisulphide of carbon, from contaminating the gas, and as the British Parliament has fixed for the Metropolitan companies a limit for the impurity beyond which they may not go, it is a desideratum to have a simple and approximately correct process for the estimation of the amount of this impurity. Especially is this the case in large works, where the nature of the gas is constantly changing, and when it is desirable to have a constant check upon the manufacture. By the present process this estimation takes about twenty hours. Mr. Harcourt has, however, succeeded in devising a process which much facilitates the operation. It is founded upon the following facts: When bi-sulphide of carbon is heated in presence of hydrogen it is decomposed into sulphuretted hydrogen, and this sulphuretted hydrogen has the property of converting a lead salt into the black sulphide of lead. The estimation is made in the following manner:—A volume of coal-gas is passed through a flask filled with small pebbles, kept at a low red heat, when the above reaction takes place; the gas is then passed through a solution containing a lead salt, until a definite brown or black tint is produced. This tint is compared with a standard color, and the amount of sulphur in the gas calculated from this.

[In our Literary Critiques reference is made to an apparatus devised by Mr. Goodwin of Philadelphia for the object above mentioned, and which by comparison may prove even more efficient than that of Mr. Harcourt.—Ed.]

Gas Stocks.

Quotations by W. B. Scott & Co., Brokers,
24 Pine Street, New York City.
October 26, 1875.

☞ All communications will receive particular attention

	Capital.	Par.	Bid.	Asked.
Gas. Co.'s of N. Y. City.				
Harlem	$1,850,000	50	133	...
Manhattan	4,000,000	50	295	300
Metropolitan	2,500,000	100	155	160
" Scrip		..	106	...
Mutual	5,000,000	100	108	112
New York	4,000,000	100	152	156
Westchester	466,000	50	100	105
Gas Co.'s of Brooklyn.				
Brooklyn	2,000,000	25	245	250
Citizens	1,200,000	20	...	152½
" Scrip		...	101	...
Peoples	1,000,000	10	100	105
" Bonds		...	98	...
" Scrip		...	102½	...
Metropolitan	1,000,000	100	104	...
Nassau	1,000,000	25	128	...
Williamsburgh	1,000,000	50	142	...
" Scrip		...	102	...
Out of Town Gas Companies.				
Buffalo Mutual, N. Y	750,000	100	50	50
Baltimore, Md.	2,000,000	100	190	...
Brockport, N. Y.	25,000	...	...	90
Citizens, Newark	500,000	...	...	55
Derby of Conn.	160,000	100	...	80
East Boston, Mass.		25	112	115
Hannibal, Mo.	100,000	100	90	...
Hartford, Conn.	700,000	25	41	43
Hempstead, L	40,000	100	...	100
Jersey City	386,000	...	160	...
Jamaica, L. I.	25,000	100	...	100
Lewistown, Maine	400,000	100	...	80
Peoples, Jersey City		...	130	...
Peoples of Albany	1,000,000	100	45	...
Peoples of Baltimore		25	108	...
Rochester, N. Y.		100	50	...
Fort Wayne, Ind.		100	...	105
Woonsocket, R. I.	150,000	100	100	...
Lima, Ohio	30,000	100	10	...

PRICES OF FOREIGN AND DOMESTIC GAS COALS.

[Reported Expressly for this Journal.]
October 16, 1875.
DELIVERED IN NEW YORK.

English Cannel.			
Ince Hall	$17 00	@	18 00
Kirkless Hall	16 50	@	17 00
English Caking Coals.			
Newcastle Gas	$5 75	@	00 00
Liverpool caking	11 50	@	12 00
British Province Coals.			
Picton	2 25		
Rock House—At Mines, $1.87, Gold	0 00		
Caledonia—At Mines, $1.75, Gold	0 00		
Little Glace Bay—At Mines, $1.75, Gold	2 00		
Lingan—At Mines, $1.75, Gold	0 00		
Sydney—Old Mine	3 00		
" Reserve, $1.75, GoldMine	2 25		
" International	— —		

(Duty, 15 cents per ton, gold. Freight to New York $2 25 currency. Cost of above coals delivered in New York, $5 25 @ $6 00½, currency.)

Pennsylvania Coals.			
Penn Gas Coal—At Amboy	$6 10	@	0 00
Westmoreland—At Amboy	6 10	@	0 00
(In New York both the above coals $6 50)			
Shafton	6 50	@	0 00
Youghiogheny	6 50	@	0 00
West Virginia Coals.			
Murphy Run	$6 50	@	0 00
Despard	6 50	@	0 00
West Fairmont	6 50	@	0 00
American Gas Coal	7 40	@	0 00
Fairmont	6 50	@	0 00
Newburgh Orrel	6 50	@	0 00
Pinnickinick	6 50	@	0 00
Cloverhill of Virginia	6 00	@	6 50
McKenzie Compound Mixture			— —
American Cannel Coals.			
Peytona of West Virginia	$12 50	@	00 00
Darlington of Pennsylvania			— —
Cannelton Cannel			11 00
Red Bank—at Philadelphia			6 50
" —at South Amboy			7 25
Asphalts.			
Albertite of New Brunswick	$— 00	@	— 00
Ritchie Mineral of West Virginia	18 00	at Balt'e.	
Trinidad Bitumen	— —	@	14 05

The Penn Gas Coal Company have contracted with the Pittsburgh Gas-Light Co. for their entire supply for the ensuing year from their Youghiogheny mines.

Advertisers Index.

☞ In looking for advertisements, see figures 1 to 12, within brackets, at head of advertisement pages.

GAS BURNERS, APPARATUS, ETC.

American Meter Co.—West 22nd st., N. Y., Arch and 22d st., Phil., 548 Washington st., Boston 11
Cast Iron Gas and Water Pipe—S. Decatur Smith, York and Moyer streets, Phila., Pa 8
Cast Iron Gas and Water Pipes—R. D. Wood & Co., Philadelphia Pa 10
Cast Iron Gas and Water Pipe—Jno. McNeal & Sons, Burlington, N. J. 8
Franklin Foundry and Pipe Works—Jas. Marshall & Co., 23 Nineteenth street, Pittsburgh, Pa 2
Gas Valves (Chapman) 75 and 77 Kilby st., Boston, Mass. 3
Gas-Burners—C. Gefrorer, 248 North 9th st., Phila., Pa. 9
Gas Purification—St. John and Cartwright 5
Gas Meters, etc.—Harris, Griffin & Co., 12th and Brown streets, Phila., Pa 10
Gas Meters, etc.—Wm. W. Goodwin & Company, 1012 Filbert street, Phila, Pa 17
Gas Meter Manufacturers—Harris & Bro., 1117 Cherry st., Philadelphia, Pa 11
Gas Fixtures, Etc.—Mitchell, Vance & Co., 597 Broadway 7
Gasholders, Etc.—Deily & Fowler, 39 Laurel st., Phila., Pa. 4
Gas Screen—James P. Mahon, Boston, Mass 5
Gas Engineer—Henry Cartwright, Phil. Pa 4
Lime Hurdles.—Manhattan Lime Hurdle Co., Geo. W. Day, Treas., No. 3 Railroad Square, Haverhill, Mass 2
Lava Tips and Scotch Tips—Charles H. Meyer & Co., 227 Chestnut street, Phil. Pa 8
National Tube Works Co., 78 William St., N. Y 7
Patent Conically Slotted Wood Trays—John L. Cheesman, 147 and 149 Avenue C., N. Y 4
Patent Gas Exhauster—Smith & Sayre, 95 Liberty street 4
Pelouze & Audouin Condenser—Jas. R. Smedberg, Sole Agent for U. S. San Francisco, Cal.; Henry Cartwright, 2107 Green street, Phil. Pa 1
Petroleum Gas—J. D. Patton, Trevertou, Pa 4
Patent Gas Exhauster—S. S. Townsend, Agt., 31 Liberty street, N. Y 3

GAS COALS

Cannelton Coal Co. of West Virginia—J. Tatnall Lea, 325 Chestnut street, Phila, Pa 3
Despard Coal Co.—Parmelee & Bros., Agents, 32 Pine st., New York 7
Gas Coals—Bird, Perkins & Job, 27 South st., N. Y. 7
Monongahela Gas Coal—56 Exchange Place, Baltimore, Md. 6
New York and Cleveland Gas Coal Company—384 Penn Avenue, Pittsburgh, Pa 6
Ohio Gas Cannel—G. Merryweather, Pine cor. Wm. sts.
Penn Gas Coal Co.—11 Merchants' Exchange, Phil. and 90 Wall street, N. Y 6
Peytona Cannel Coal—S. E. Low, 58 Broadway, N. Y 5
The Newburg Orrel Coal Co.—Chas. W. Hays, Agent in New York, Trinity Building, 111 B'way, Room 7 6
Tyrconnell Gas Coal—52 S. Gay Street, Baltimore, Md 6
Westmoreland Coal Co.—230 South 3rd Street, Phil. Pa ..... .
Youghegheny Coal—Perkins & Job, 27 South St. N. Y 7

FOUNDRIES.

Atlantic Dock Iron Works—John P. Kennedy, Office 98 Liberty street, N. Y., P. O. Box 2348 .....
Cast-Iron Pipes and Fittings—B. S. Benson, 52 East Monument street, Baltimore, Md .....
Continental Works—T. F. Rowland, Greenpoint 6
Camden Iron Works, Camden, N. J.—Jesse W. Starr & Son.
Gloucester Iron Works—J. P. Michellon, Sec., 6 North 7th street, Phila., Pa 4
Mill Street Foundry.—Geo. Stacey & Co., Cincinnati. O 5
National Foundry and Pipe Works—Wm. Smith, Carroll, Pike, Smaliman & Wilkins streets, Pittsburg, Pa .....
Oregon Iron Foundry.—Herring & Floyd, 740 Greenwich street, N. Y 10
Pascal Iron Works—Morris, Taskar & Co., Philadelphia 12
Providence Steam and Gas Pipe Co., Providence, R. I.—H. A. Branch, Agent 3

WATER METERS, PUMPS, ETC.

Cast Iron Pipes for Water and Gas—Riley A. Brick, 112 Leonard street, N. Y 10
Valves for Water, Steam and Gas—Ludlow Valve Man'g Co., 940 River street, Troy, N. Y 6
Water Pipes, etc.—S. Fulton & Co., 412 Walnut st., Phila 7

CLAY RETORT WORKS.

B. Kreischer & Son, Clay Retorts, etc., 58 Goerck st., N. Y. 8
Cheltenham Fire Brick and Clay Retort Works—Evens & Howard, 916 Market street, St. Louis, Mo ..... .
Manhattan Clay Retort Works, 18th st., near Av. C, N. Y. 8
Philadelphia Fire Brick Works, Vine and 23d sts., Phila 8

LAMPS, STOVES, PETROLEUM, ETC.

Lamps—M. B. Dyott, 114 South 2nd Street, Phil. Pa. 1
Patent Lamp Post—J. W. Graham, Chillicothe, Ohio, or A. M. Callender, office of this Journal 9

MISCELLANEOUS.

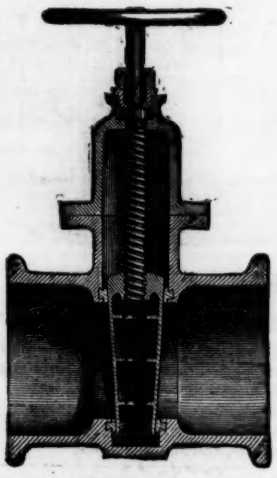
Analysis and Testing of Gas Coals—Prof. Henry Wurtz, 12 Hudson Torrace, Hoboken, N. J. 10
Architect and General Gas Engineer—William Farmer, 111 Broadway Room 95, N. Y 5
Brass Cocks, Plumbers' Materials, etc., etc.—McNab & Harlin Manufacturing Co., 56 John st., N. Y 7
Cements—S. L. Merchant & Company, 76 South st., N. Y.
Contractors for Gas Works, Etc.—Murray & Baker, Fort Wayne, Ind 2
Fodell's System of Bookeeping—A. M. Callender & Co., 42 Pine st., New York 1
Gas Engineer—B. E. Chollar, 914 Olive St., St. Louis, Mo.
Gas-Light Company of America, 63 and 64 Drexel Building, New York 2
Kidd's Gas Consumers Guide—A. M. Callender & Co., 42 Pine Street, N. Y ..... .
Massachusetts Institute of Technology—Samuel Kneeland Boston, Mass ..... .
National Coal Gas Company—H. P. Allen, 4 Warren street New York 6
School of Mines, Columbia College, East 49th st 9
Screening Shovels—Herring & Floyd, 740 Greenwich st., New York 7
Scientific and Practical Chemist and Geologist—Professor Henry Wurtz, 12 Hudson Terrace, N. J ..... .
Screening Shovels—G. W. Dean, 1358 Broadway, N. Y. ..... .
Springfield Gas Machine—Corner Canal and Centre St. ..... .
Slade's Automatic Fire Governor—Jas. Slade, Gas Works, Yonkers, N. Y ..... .

CHAPMAN VALVE MANUFACTURING CO.

MANUFACTURERS OF

CHAPMAN GAS VALVES.

Office and Sales Room 75 and 77 Kilby Street, Boston.



These Valves have been in use for several years, and are pronounced by all who have used them to be

The Best Gas Valves Ever Made.

They afford a direct passage the full size of the pipe. The seats are made of an alloy similar to BABBITT metal, specially prepared for the purpose, and superior to all other metals used for the seats of Gas Valves. It does not corrode under any circumstances to which it is exposed.

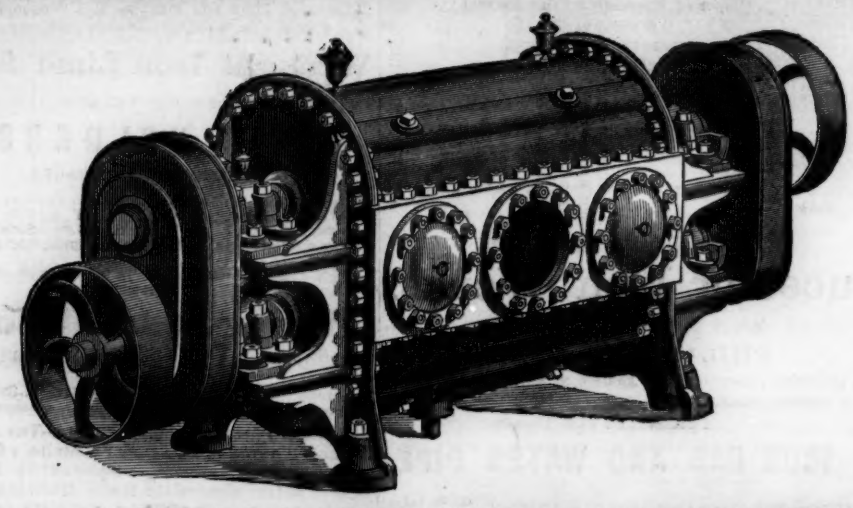
There is no LIABILITY OF COHESION between the Gate and Seat, and the Valves can be relied upon to SHUT TIGHT and OPEN EASILY at all times—an important desideratum when used for street mains, in cases of fire.

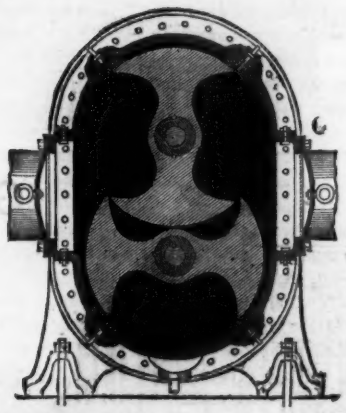
We refer to the following named Gas-Light Companies among the many that have used these Valves:

BOSTON GAS-LIGHT COMPANY, BOSTON, MASS.
CAMBRIDGE GAS-LIGHT COMPANY, CAMBRIDGE, MASS.
NEWTON & WATERTOWN GAS-LIGHT CO., WATERTOWN, MASS.
LAWRENCE GAS-LIGHT COMPANY, LAWRENCE, MASS.
PEOPLES GAS-LIGHT COMPANY, BROOKLYN, N. Y.
CITIZENS GAS-LIGHT COMPANY, BROOKLYN, N. Y.
SOUTH BOSTON GAS-LIGHT COMPANY, BOSTON, MASS.
CHARLESTOWN GAS-LIGHT CO., CHARLESTOWN, MASS.
LYNN GAS-LIGHT COMPANY, LYNN, MASS.
FITCHBURG GAS-LIGHT COMPANY, FITCHBURG, MASS.
CITIZENS GAS-LIGHT COMPANY, NEWARK, N. J.
WILLIAMSBURGH GAS-LIGHT CO., WIRLIAMSBURGH, N. Y.

GAS AND WATER VALVES ½ INCH TO 36 INCHES DIAMETER.
STEAM VALVES ½ INCH TO 12 INCHES DIAMETER.
857-tf

PATENT IMPROVED GAS EXHAUSTER.





P. H. & F. M. ROOTS, PATENTEES AND MANUFACTURERS, CONNERSVILLE, IND.
S. S. TOWNSEND, GENERAL AGENT, 31 LIBERTY STREET, NEW YORK.

The following are some of the advantages we claim for this Exhauster over all others:

FIRST.—It is simpler in its mechanical construction than any other Exhauster in use.

SECOND.—The internal parts consist of only two revolvers, each cast entire in one piece, without a single screw, bolt, nut, washer, key or other part to get loose on the inside and stop or break the machine. The internal operating parts, therefore, can not get out order and hence require no care or attention.

THIRD.—Every part of the machine requiring care or attention, as the journals, gearing, etc., is external, easily observed and attended to. All changes, adjustments, and repairs are made from the outside. The journal bearings, if necessary, can be renewed in a few minutes.

FOURTH.—The internal operating parts are practically gas-tight, but are not in actual contact, hence there is no internal friction or wear. The machine is therefore operated with less power than any other.

FIFTH.—They are built in the most complete and substantial manner, with steel shafts and improved journal bearings, and their durability is almost without limit.

We build them of any required capacity, large or small, adapted to any kind of works or place.

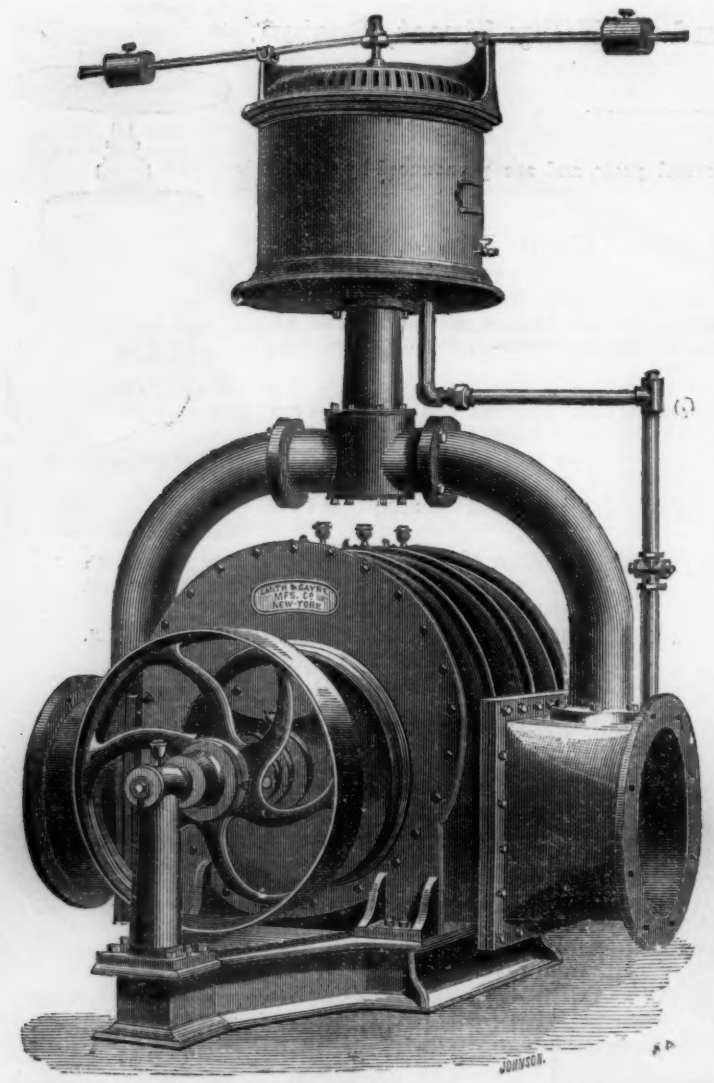
Send for Illustrated Catalogue, giving all particulars as to capacity, speed, power required, dimensions, and price of each size and references to parties using them.

P. H. & F. M. ROOTS.

SMITH & SAYRE MANUFACTURING COMPANY.

The Mackenzie Patent Gas Exhauster

And Patent Compensator.



They are made to pass from 4,000 to 150,000 cubic feet of gas per hour; will increase the production and illuminating power of the gas, and add very much to the durability of the retorts, either clay or iron. The Compensator obviates entirely the necessity of water-jo ints, is compact, durable, cleanly, not liable to get out of order, self-acting, quiet, and certain in its operation.

We are also sole proprietors and manufacturers of the

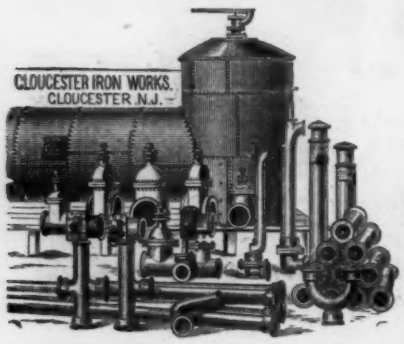
MACKENZIE PATENT BLOWER, PATENT CUPOLA AND SMELTING FURNACE.

The Blower is a Force Blast machine, durable built, and can be driven with one-third the power required to drive the ordinary Fan

The Cupolas are manufactured in sizes to melt from 1 to 30 tons per hour, will save one quarter of the time required by the old style Cupola and 33 per cent fuel. Address

JAMES M. SAYRE, Treasurer. G G. PORTER, President.

CHARLES W. ISBELL, Secretary. OFFICE, 95 LIBERTY STREET, New York.



Gloucester Iron Works,

OFFICE—NO. 5 NORTH SEVENTH STREET,

PHILADELPHIA.

DAVID S. BROWN, Pres't. JAMES P. MICHELLON Sec'y.
BENJAMIN CHEW, Treas. WILLIAM SEXTON, Sup't.

CAST IRON GAS AND WATER PIPE.

Cast Iron Heating and Steam Pipe. Stop Valves. water or Gas.

Fire Hydrants,

GAS HOLDERS

EVENS & HOWARD,

Manufacturers of a superior quality of

Fire-Brick, Clay Gas Retorts,

Gas Tile, Drain Pipe, Fine Ground Fire Clay, &c.

916 Market Street, St. Louis, Mo.

TYRCONNELL GAS COAL.,

MINED IN TAYLOR COUNTY, WEST VA.

Company's Office, 52 S. Gay St., Baltimore.

CHARLES MACKALL, Secretary.

CHARLES W. HAYS, Agent, Room 7, 111 B'way, N. Y.

SHIPPING POINT—Baltimore, Md.

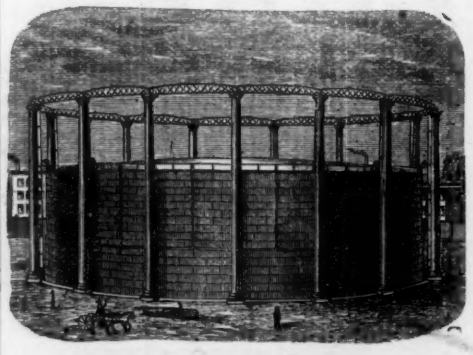
This coal yields 10,000 cubic feet of Gas, with an illuminating power of over 16 candles. Forty bushels of very superio Coke. with little Ash, and scarcely any clinker. 304-1y

T. F. ROWLAND,

Continental Works,

GREENPOINT, BROOKLYN, N. Y.

ENGINEER, AND MANUFACTURERS OF



GAS-HOLDERS

OF ANY MAGNITUDE,

Condensers, Scrubbers, Purifiers, Retorts, Hydraulic Mains and all other articles connected with the Manufacture and Distribution of Gas, furnished with despatch. Plans and Specifications prepared, and Proposals given for the necessary Plans for Lighting Cities, Towns, Mansions, and Manufactories.

JESSE W STARR & SON,

Camden Iron Works

Camden, New Jersey,

Philadelphia Office, People's Bank Building, 435 and 437 Chestnut Sireet.

MANUFACTURERS OF

ALL KINDS OF CASTINGS AND APPARATUS FOR GAS WORKS,

Wrought Iron Roof Frames,

For Retort and other houses Retorts and all castings required for setting them in the latest and most improve model. WASHERS, CONDENSERS, SCRUBBERS and EXHAUSTERS for relieving the Retorts from pressure. PURIFIERS, varyin from 2,000 to 2,000,000 cubic feet daily purifying capacity.

Wrought Iron Lime Sieves

for Purifiers. Station Meters of all sizes.

GAS HOLDERS,

TELESCOPIC AND SINGLE,

With cast iron guide and suspension frames. GASERNORS or REGULATORS, STREET MAINS, from 1½ 48 INCHES DIAMETER, for WATER or GAS. Street Main connections, such as BRANCHES, BENDS, DRIPS, SIEVES, etc.

STOP VALVES, from 3 to 30 inches, for both Water and Gas.

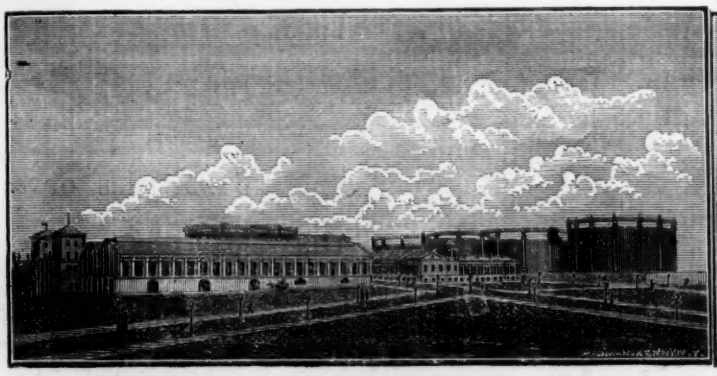
Wrought Iron Work.

All the Smith and Sheet Iron work required in and abou Gas Works. 226-tf

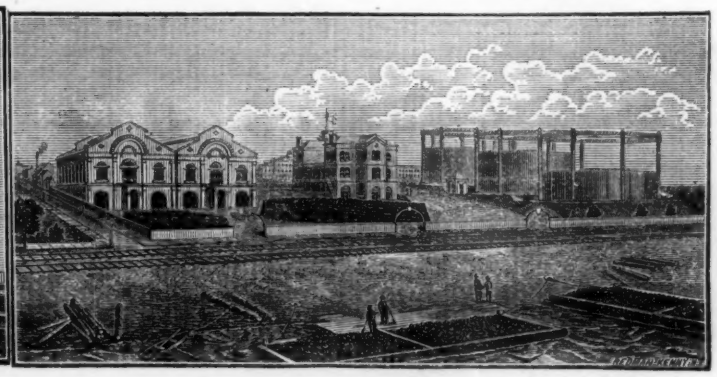
JESSE W. STARR. JESSE W. STARR, JR.

A New Antiseptic Dressing.—The *Edinburgh Medical Journal* of September contains a formula for a new antiseptic dressing employed by Lister in a case of rodent ulcer of the face: Boracic acid in fine powder, one part; white wax, one part; paraffin, two parts; almond oil, two parts. The ingredients, after being mixed by melting the wax and paraffin, are stirred in a warm mortar till the mass thickens, and then set aside to cool, after which the fine substance is reduced in a cold mortar, in successive portions, to a uniform soft ointment. This is spread thin on a fine rag, and when the almond oil leaves it, as it soon does through the capillary attraction of the porous external dressing, a smooth, firm layer remains, which can be separated from the skin without leaving any greasy substance adhering, and does not at all confine the discharge which, while freely shed, is perpetually supplied with a sufficient quantity of boracic acid to insure absence of putrefaction, while not preventing cicatrization.

Another, and, it is thought by Dr. Henry (*London Medical Record*) a better application in cases of this nature, is an ointment composed like the one above described; except that instead of one part of boracic acid, it contains half the quantity of salycilic acid, the antiseptic virtues of which have been recently discussed by Prof. Kolbe, of Leipsic.



CINCINNATI GAS WORKS. ERECTED 1871-72-73.—WM FARMER, ENG.



LACLEDE GAS WORKS, ERECTED 1872.—WM. FARMER, ENG

WILLIAM FARMER,

ARCHITECT AND GENERAL GAS ENGINEER,

111 BROADWAY, TRINITY BUILDING, Room 95, New York.

WILLIAM FARMER may be consulted upon all matters connected with the construction of GAS WORKS, or any other description of buildings. Will furnish General and Detail Drawings, Specifications and Estimates for Gas Works of any capacity.

PATENTEE OF THE FOLLOWING INVENTIONS:

Exhausters for Gas and Foul Lime Ventilation,
Dumping Barrows for Coal, Coke and Lime,
Hydraulic Mains for Retort Benches,
Blowers for Forges, Foundries, &c.
Pumps for Water, &c., &c.

REFERENCES:

Professor SILLIMAN, New Haven, Conn.
GEN. CHAS. ROOME, President Manhattan Gas-Light Company, N. Y.
A. W. BENSON, President Brooklyn Gas-Light Company, Brooklyn, N. Y.
W. W. SCARBOROUGH, President Cincinnati Gas-Light Company, Cincinnati, Ohio.
S. L. HUSTED, President Laclede Gas-Light Company, St. Louis, Mo.
Prof. HENRY WURTZ, Editor AMERICAN GAS-LIGHT JOURNAL, N. Y.
GEN. A. HICKENLOOPER, Vice-President Cincinnati Gas-Light Co., Cincinnati, Ohio
FREDERICK CROMWELL, Vice-President Laclede Gas-Light Company, St. Louis Mo.
C. VANDERVOORT SMITH, Engineer Manhattan Gas-Light Company, N. Y.
JAMES R. SMEDBERG, Consulting Engineer, San Francisco Gas-Light Co., Cal.

P.P. DEILY. 1842. J. FOWLER. 1875.

DEILY & FOWLER,

39 LAUREL STREET, PHILADELPHIA, PA.,

Builders of Gas Works.

MANUFACTURERS OF

GAS-HOLDERS,

Single and Telescopic.

WROUGHT IRON ROOF FRAMES,
COAL WAGONS,
COKE BARROWS,

AND ALL

Wrought Iron Work

CONNECTED WITH GAS WORKS.

☞ Particular attention paid to Extensions and Repairs.

B. S. BENSON.

MANUFACTURER OF

Cast Iron Pipes and Fittings,

AND

Gas and Water Mains.

All sizes from 3 to 30 inch cast vertically in 12½ feet lengths

Office & Factory 52 East Monument St.,

BALTIMORE, MD.

DUFFEE'S IMPROVED

GAS SCREEN,

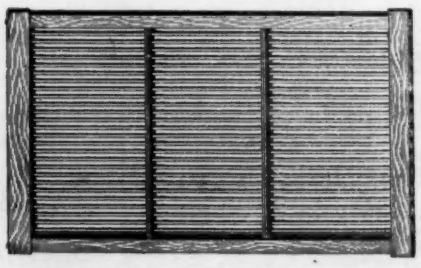
OFFICE 19 TREMONT ROW, ROOM 5,

BOSTON, MASS.

JAMES P. MAHAN, Treasurer.

Manufactory at Haverhill, Mass.

E. DUFFEE, Agent,
Formerly with AMERICAN GAS SCREEN CO.,
Haverhill, Mass.



The Screen is made with an ash or oak frame, perforated with ROUND RATTANS, turned and reeved through, drawing the frame firmly together, strengthening it *without the use of nails or rivets.*

This Screen is reversible, can be used either side up, gives a large purifying capacity; there is no clogging by foul lime, as the rattan presents a smooth surface and can be cleaned very easily. It is considered by all Gas Engineers who have used it to be the best Screen now in use.

☞ **Samples sent Free to all Parts of the United States.**

All communications should be addressed to

JAMES P. MAHAN,
19 Tremont Row, Room 5.
Boston, Mass.

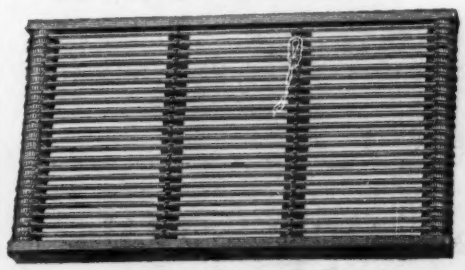
384-6t

THE MANHATTAN

LIME HURDLES

after a practical trial have been adopted by over thirty Gas-Light Companies *the last season*, some of them the largest in the country.

They are LIGHT, STRONG and DURABLE, made *with Ash frame* and *round flexible Rattans.*



Shipped to all parts of the country.
Address

THE MANHATTAN

LIME HURDLE CO.

HAVERHILL, MASS.

J. L. BLAISDELL, President.
GEORGE W. DAY, Treasurer. 389

ADHESIVE LABELS.—Dissolve one and one-seventh ounces of common glue, which has lain a day in cold water, with some candy sugar and three-quarters of an ounce of gum arabic, in six ounces hot water, stirring constantly until the whole is homogeneous. If this paste is applied to labels with a brush and allowed to dry, they will then be ready for use on merely moistening with the tongue.

GAS COALS.

THE
PENN GAS COAL COMPANY

OFFER THEIR

COAL, CAREFULLY SCREENED,

AND PREPARED FOR

GAS PURPOSES.

Their Property is located in the Youghiogheny Coal Basin, near Irwin's and Penn Station, on the Pennsylvania Railroad, and on the Youghiogheny River.

OFFICES

No. 11 Merchants Exchange, Phil'a. 90 Wall Street, New York.

PLACES OF SHIPMENT.

Pennsylvania Railroad, Pier No. 2 (Lower Side).
Greenwich Wharves, Delaware River.
366-1y **Pier No. 1 (Lower Side), South Amboy, N. J.**

CANNELTON COAL CO.

OF WEST VIRGINIA.

Offer for sale the following Coals, from their Colliery at CANNELTON, Kanawha County, West Virginia, delivered at RICHMOND, Va.:

CANNELTON CANNEL,

cknowledged to be the most valuable ENRICHER produced in this country, a gross ton yielding 10,000 ubic feet of GAS of 64·54 CANDLE POWER; COKE 32 bushels, of good quality.

CANNELTON CAKING COAL.

Volatile Matter.	Coke.	Per cent. of Ash in Coal.	Per cent. of Ash in Coke.	Sulphur in Coke.	Sulphur in Oötl.	Sulphur in Volatile Matter.	Specif. Gravity. Coal.	Specif. Gravity. Gas.
35.1	64.9	2	6	.82	1.48	.66	1.289	.476

MAXIMUM YIELD, 5.06 cubic feet of Gas per pound of Coal—A yield of 4·78 cubic feet per lb.—gave 16 14-100 Candle-Power.

COKE, of very fine quality—1453 pounds produced from one ton of coal.

SALES AGENTS { **J. TATNALL LEA**, Treasurer, P. O. Box 1747 Philadelphia. **PERKINS & JOB**, 27 South Street, N. Y.; 91 State Street, Boston. **H. W. BENEDICT & SON**, New Haven.

JAMES McELVIE,

CANNEL COAL MERCHANT,

HAYMARKET, EDINBURGH.

ESTABLISHED 1840.

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THE BOGHEAD

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THE DUKE OF HAMILTON'S

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CANNEL COALS.

THE DUKE OF HAMILTON'S

Home Farm and Bog CANNEL COALS.

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CANNEL COALS.

Analyses and Prices of all the principal SCOTCH CANNEL COALS will be forwarded on application. 329-1y

THE NEWBURGH

Orrel Coal Company,

Mines at Newburg, Preston County, W. Va.

Company's Office, No. 52 S. Gay Street, Baltimore, Md.

C. OLIVER O'DONNELL, Pres't. CHAS. MACKALL, Sec'y.

CHAS. W. HAYS, Agent in New York, Room 7, Trinity Building, 111 Broadway.

SINCLAIR & AGNEW, Agents, Alexandria, Va.

This Company offer their very superior Gas Coal at lowest market prices.

It yields 10,996 cubic feet of gas to the ton of 2,240 lbs. of good illuminating power, and of remarkable purity; one bushel of lime purifying 6,792 cubic feet, with a large amount of coke of good quality.

It has been for many years very extensively used by various Gas Companies in the United States, and we beg to refer to the Manhattan, Metropolitan, and New York Gas Light Companies of New York; the Brooklyn and Citizen's Gas Light Companies of Brooklyn, N. Y.; the Baltimore Gas Light Company of Baltimore, Md., and the Providence Gas Light Company, Providence, R. I.

The best dry coals shipped, and the promptest attention given to orders. 294-1y

THE DESPARD COAL COMPANY

OFFER THEIR SUPERIOR

DESPARD COAL

To Gas Light Companies throughout the country.

Agents, PARMELEE BROTHERS, No. 33 Pine street, N. Y.

BANGS & HORTON, No. 31 Duane street, Boston.

Mines in Harrison County, West Virginia.

Wharves Locust Point, Company's Office, 29 South street, } Baltimore.

Among the consumers of Despard Coal, we name: Manhattan Gas Light Company, New York; Metropolitan Gas Light Company, New York; Jersey City Gas Light Company, N. J.; Washington Gas Light Company; Portland Gas Light Company, Maine.

*** Reference to them is requested. 294-1y

NEW YORK AND CLEVELAND

GAS COAL COM'Y

Of Pittsburgh, Pa.

MINERS AND SHIPPERS OF

YOUGHIOGHENY GAS COAL.

This Company is prepared to furnish any amount of their justly celebrated, and acknowledged superior GAS COAL, to any point reached by railroad or navigation, on most favorable terms.

General Office—384 Penn Avenue,
PITTSBURGH, PA.

Branch Office—C. & P. RR. Coal Pier,
CLEVELAND, OHIO.

WILLIAM A. McINTOSH, President.
A. CARNEGIE, Vice-President.
W. P. DE ARMIT, Treasurer.
THOMAS AXWORTHY, Agent at Cleveland, Ohio.
W. H. WATERBURY & CO., General Sales Agents, 137 Broadway, New York.
351-1y

PEYTONA

CANNEL COAL

From West Virginia.

Yields over 13,000 feet of Gas per ton. At ten thousand feet (standard yield) the illuminating power is over 43 candles. Purifies 4,510 feet to the bushel of lime.

S. E. LOW, Secretary,
Office, 58 Broadway.

OFFICE OF THE

NATIONAL COAL GAS COMPANY,

No. 4 Warren Street, New York.

H. P. ALLEN, President.
I. B. BRICE, Vice-President.
A. H. ALLEN, Secretary.
WM. J. VALENTINE, Treasurer.
GEORGE W. HARRIS, Engineer.

This Company is the owner of the GWYNNE-HARRIS, or AMERICAN HYDROCARBON process, for making Gas for Lighting or Heating purposes, by the perfect decomposition of superheated steam, under what is known as the

GWYNNE AND HARRIS PATENTS.

This process has been fully tested nearly 50,000,000 cubic feet of Gas having been made under it, and fully demonstrating the fact that it is the greatest improvement ever made in the manufacture of Gas, either for Lighting or Heating purposes. With half a ton of Anthracite Coal 150,000 cubic feet of Gas per day is made from three benches, and the labor is so small that one man can attend three or four benches.

The process can be put into either Coal or Oil Gas Works (or where both Coal and Oil are used) at small cost, without any interruption to the working of other benches. The Citizens Gas-Light Company of Brooklyn, after using it for more than seven months, have found it not only far better, but actually *cheaper* than atmospheric air in making Gas, with the use of "petroleum and its products."

Further information, and terms of sale of rights will be given, upon application to the Company 348-1y

Portland Cement,
Roman Cement,
Keene's White Cement,

NUMBERS 1 AND 2.

From best London Manufacturers.

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335-

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ENAMELED GAS AND WATER PIPE,

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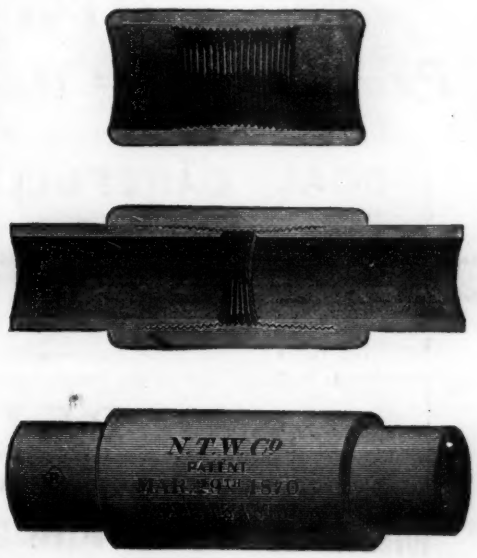

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Offer for Sale the

YOUGHIOGHENY COAL

DOUBLE SCREENED,

from their Colliery at Smith's Mills, on the Youghiogheny River, thirty-seven and a half miles southerly of Pittsburgh. This Coal has the preference in Pittsburgh over all other YOUGHIOGHENY COAL for GAS PURPOSES.

The facilities of the WAVERLY COMPANY are unsurpassed by those of any other Company on the Youghiogheny.

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CHARTERED 1854.

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Since the commencement of operations by this Company its well known

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has been largely used by the GAS COMPANIES, RAILROADS, and IRON and STEEL WORKS in the New England and Middle States, and its character is established as having no superior for freedom from sulphur and other impurities.

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200 Tons
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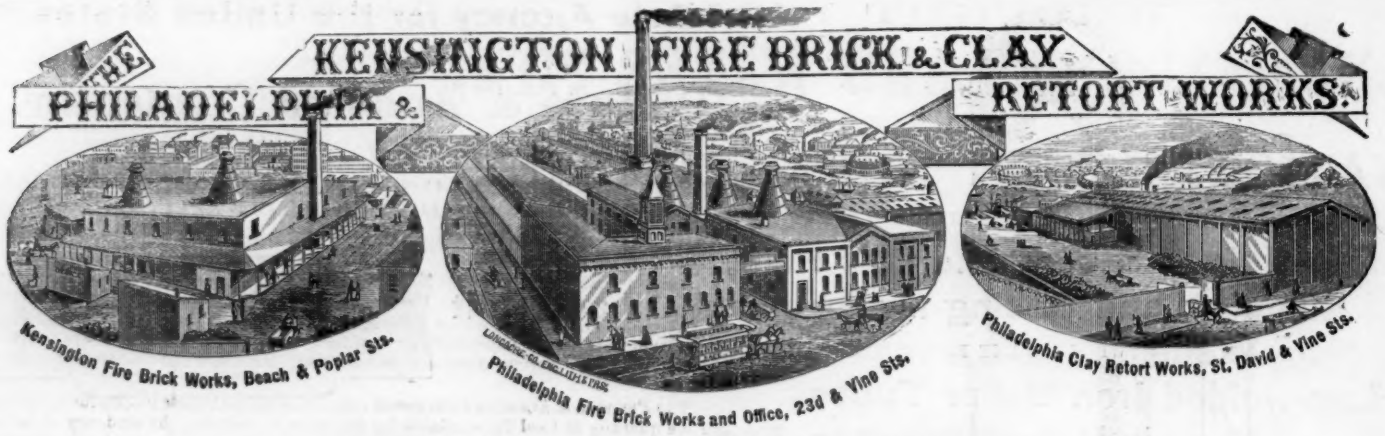
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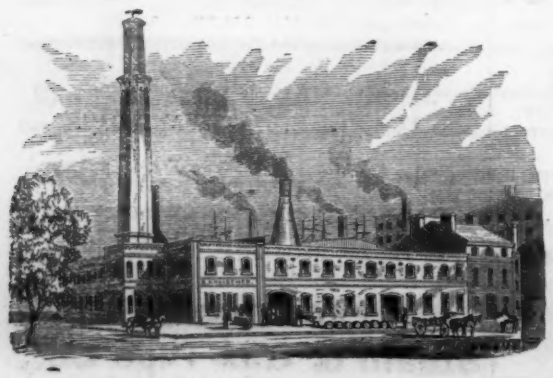

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Retort Works.

☞ *Established in* 1845. ☜
(Branch works at Kreischerville, Staten Island.)

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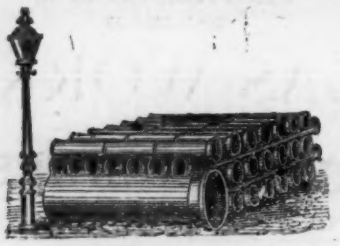

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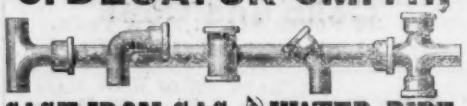

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THE GAS-LIGHT COMPANY OF AMERICA, owners of the Patent Processes for making ILLUMINATING GAS from PETROLEUM and its products, known as the

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An examination of the merits of these inventions as demonstrated by practical experience in a large number of Gas Works employing them, will not fail to convince the intelligent Gas Manufacturer of the great advantages derived from their use.

Gas of unexceptional quality, of high illuminating power is made at many of these works by these processes, at a cost of from 40 per cent. to 60 per cent. less than an ordinary qualito of illuminating gas can be made by any other methods in use. Gas Companies generally may easily, and at small outlay for making the necessary changes in manufacturing apparatus, double their net earnings, and supply a much better light their patrons, at greatly reduced prices.

The Company respectfully refer to Companies using these processes in this city, Brooklyn, Newark, Chicago and elsewhere, and especially to the Mutual Gas-Light Company of Detroit, Mich., whose works more nearly conform in all details of construction to the original plans of the inventors, thanth ose of other Companies.

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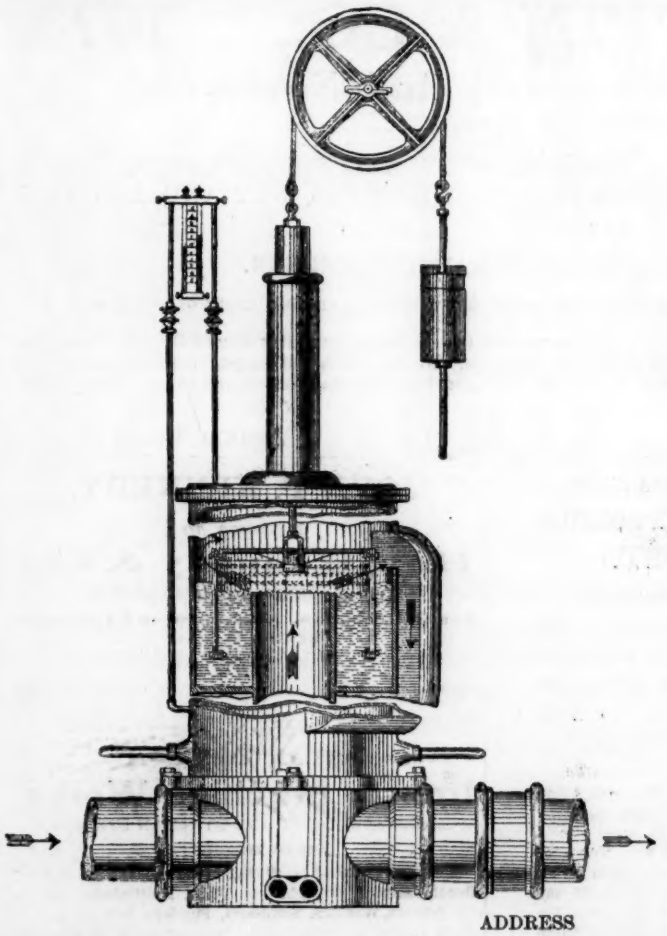

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Sole Agency for the United States.

THE

Pelouze & Audouin Condenser.

PATENT MAY 26, 1874.

With SMEDBERG'S COMBINED BYE-PASS, REVERSED FLOW, and DIFFERENTIAL GAUGE.

PATENT JULY 21, 1874.

This apparatus is based upon the recent discovery by Messrs. PELOUZE & AUDOUIN of the principle of Condensation by impact, or percussion.

All gas-makers are aware how difficult it is to separate all the Coal Tar and Water from Crude Coal Gas by mere cooling; and how frequently these liquids are swept on to the purifiers, even where scrubbers or washers of large size and considerable cost are employed.

The PELOUZE & AUDOUIN CONDENSER completely arrests these by-products, increasing the quantity of Coal Tar available for fuel or sale, reducing the tendency of the purifying material to cake on the trays, and yielding a gas-liquor of remarkable strength. Hence, all the processes of purification are facilitated, while its simultaneous arrest of heavy percentages of Naphthaline reduces the risk of stoppages to a minimum.

The subordinate patent of July 21, 1874, combines a Bypass with the Condenser; and thus saves to the purchaser the cost and slow action of three valves, together with the space occupied by these valves and the necessary connections.

The Differential Gauge is so constructed that there is no oscillation of its water-columns; while it indicates inlet pressure, outer pressure, or back-pressure, at the will of the observer.

IT IS POSITIVELY GUARANTEED THAT EVERY CONDENSER SHALL BE OF PERFECT MECHANICAL CONSTRUCTION, AND SHALL DISCHARGE ITS FUNCTIONS SATISFACTORILY.

The Condensers are now used or ordered by the following American Gas Works:

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St. John and Cartwright's
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Has purified, per bushel, on a single test, 10,000 feet of Westmoreland Gas. With revivification lasts indefinitely. Surpasses in POWER and ECONOMY all known materials. Saves largely in FIRST COST, SPACE, LABOR, SUPERINTENDENCE, and all current expenses. Will purify *easily* sulphurous gas, wholly *unmanageable by lime.* Takes out *all the ammonia.* Now operating in the following Gas Works: Harlem New York (21st street); Port Morris; Hunter's Point; East New York Worcester, Lynn and Cambridge, Mass.; Lewiston, Maine; St, Albans, Vt.; Pawtucket, R. I.; Meriden, Ct., and being introduced in many other places.

Cost 70 cents per bushel. One bushel for each square foot of Purifier sufficient. Rights to use for life of Patents, for daily makes of gas in thousands; under 25,000 $200; under 50,000, $400; under 100,000, $500 $250 additional for each additional 50,000 per day.

For further information and instructions, apply to

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☞ Immediate arrangements are urged, as the demand for the prepared composition is increasing *so rapidly* that delays in supply may occur.

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Coke and Coal
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MADE FROM BEST MALLEABLE IRON AND STEEL.

FURNISHED WITH LONG OR D HANDLES

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B.—Pipe from 3 inch and upwards, cast in 12-ft. lengths.

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The support and confidence of Gas Companies, so long enjoyed by us, encourage us to pursue the same undeviating course that has contributed to establish the character of our house, and with our extended experience and increased facilities, develop the latest improvement that Science can apply, in the construction of Gas Meters, etc., and thereby merit a continuance of the favors hitherto so liberally extended to us, always guaranteeing satisfaction.

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Blank Books, with printed headings and forms on this system, will be supplied to Gas Companies, by applying to W. P. FODELL, Philadelphia, or

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BENCH CASTINGS
from benches of one to six Retorts each.

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EXHAUSTERS
for relieving Retorts from pressure.

BENDS and BRANCHES
of all sizes and description.

FLOYD'S PATENT
MALLEABLE RETORT LID.

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FURNACE DOOR AND FRAME.

SELLER'S CEMENT
for stopping leaks in Retorts.

GAS GOVERNORS,

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Gas Consumers' Guide

Enables every Gas Consumer to ascertain at a glance, without any previous knowledge of the Gas Meter, the quantity and money value of the Gas consumed. Also the best method of obtaining from Gas the largest amount of its light.

It will be to the advantage of Gas Companies to supply their Consumers with one of these Guides, as a means of preventing complaints arising from their want of knowledge in regard to the registration of their meters. For sale by

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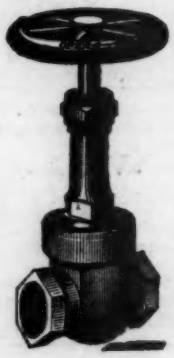

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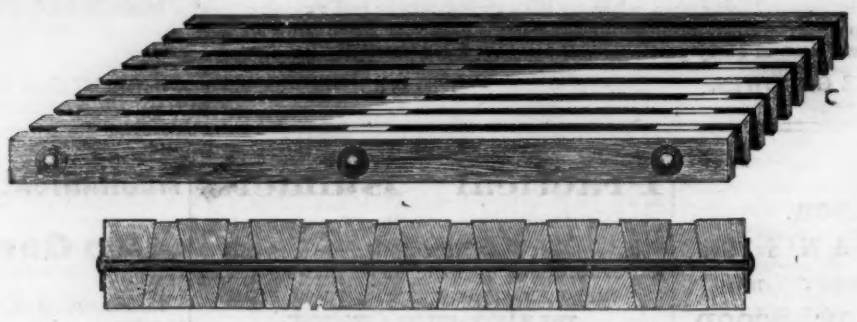

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